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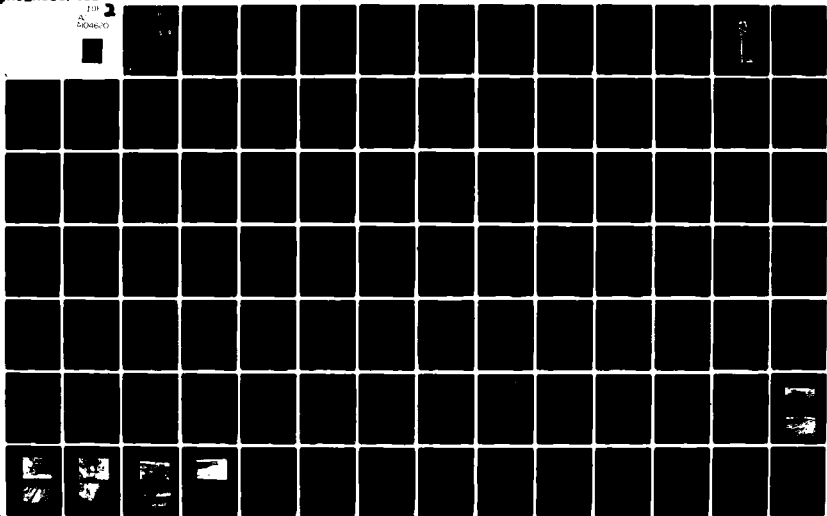
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MISSISSIPPI-SALT-QUINCY RIVER BASIN

LOST LAKE DAM
LINCOLN COUNTY, MISSOURI
MO. 10212

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**PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM**

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report was prepared under the National Program of Inspection of Non-Federal Dams. This report assesses the general condition of the dam with respect to safety, based on available data and on visual inspection, to determine if the dam poses hazards to human life or property.		

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DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
210 NORTH 12TH STREET
ST. LOUIS, MISSOURI 63101

IN REPLY REFER TO

SUBJECT: Lost Lake Dam (Mo. 10212) Phase I Inspection Report

This report presents the results of field inspection and evaluation of the Lost Lake Dam (Mo. 10212).

It was prepared under the National Program of Inspection of Non-Federal Dams.

SUBMITTED BY: SIGNED
Chief, Engineering Division

28 SEP 1979
Date

APPROVED BY: SIGNED
Colonel, CE, District Engineer

28 SEP 1979
Date

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LOST LAKE DAM

LINCOLN COUNTY, MISSOURI

MISSOURI INVENTORY NO. 10212

PHASE I INSPECTION REPORT

6 NATIONAL DAM SAFETY PROGRAM

Lost Lake Dam (~~Inventory Number~~ MO 10212).
Mississippi-Salt-Quincy River Basin,
Lincoln County, Missouri.
Phase I Inspection Report.

PREPARED BY

CONSOER, TOWNSEND AND ASSOCIATES LTD.

ST. LOUIS, MISSOURI

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ENGINEERING CONSULTANTS, INC.

ENGLEWOOD, COLORADO

A JOINT VENTURE

UNDER DIRECTION OF

ST. LOUIS DISTRICT, CORPS OF ENGINEERS

FOR

GOVERNOR OF MISSOURI

SEPTEMBER 1979

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam: Lost Lake Dam, Missouri Inv. No. 10212
State Located: Missouri
County Located: Lincoln
Stream: Lost Creek
Date of Inspection: June 15, 1979

Assessment of General Condition

Lost Lake Dam was inspected by the engineering firms of Consoer, Townsend and Associates LTD., and Engineering Consultants, Inc. (A Joint Venture) of St. Louis, Missouri using the "Recommended Guidelines for Safety Inspection of Dams". These guidelines were developed by the Chief of Engineers, U.S. Army, Washington, D.C., with the help of Federal and State agencies, professional engineering organizations, and private engineers. The resulting guidelines are considered to represent a consensus of the engineering profession.

The overall structural condition of the dam appears to be good. The dam does not exhibit signs of structural instability. The dam appears adequately maintained.

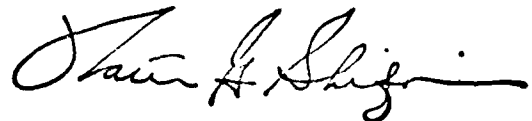
Based on the criteria in the guidelines, the dam is in the high hazard potential classification, which means that loss of life and appreciable property loss could occur in the event of failure of the dam. The estimated damage zone extends approximately 3.5 miles downstream of the dam. Within the damage zone are three dwellings, two buildings and a quarry and plant which may be subjected to flooding, with possible damage and/or destruction, and possible loss of life. The Lost Lake Dam is in the small size classification since it is less than 40 feet high and impounds less than 1,000 acre-feet of water.

Our inspection and evaluation indicate that the spillway of Lost Lake Dam does not meet the criteria set forth in the guidelines for a dam having the above size and hazard potential. Lost Lake Dam being a small size dam, with a high hazard potential, is required by the guidelines to pass from one-half Probable Maximum Flood to the Probable Maximum Flood without overtopping. Since there is high hazard potential downstream of the dam, the appropriate spillway design flood for this dam is the Probable Maximum Flood. It was determined that the reservoir/spillway system can accomodate 81 percent of the Probable Maximum Flood without overtopping the dam. Our evaluation indicates that the reservoir/spillway system will accomodate the 100-year flood without overtopping the dam.

The Probable Maximum Flood is defined as the flood discharge that may be expected from the most severe combination of critical meteorological and hydrologic conditions that are reasonably possible in the region. The 100-year flood is defined as a flood having a one percent chance of being equalled or exceeded during any given year.

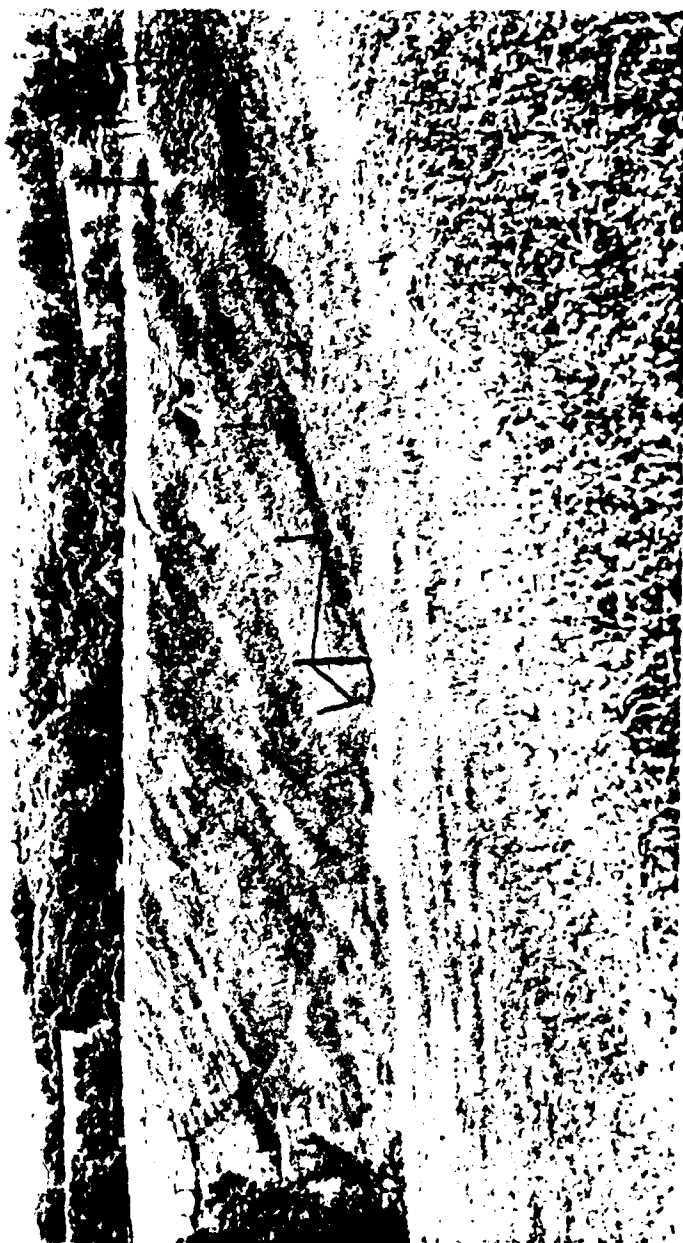
Other conditions noted by the inspection team were: minor seepage at the principal spillway outlet; minor erosion on the upstream slope; tall grass growing around the principal spillway intake; and minor erosion near the crest at the left abutment.

The absence of seepage and stability analyses is a deficiency which should be corrected. Deficiency in the spillway capacity should also be corrected. Periodic inspections by a qualified engineer and establishing a maintenance log are recommended.



Walter G. Shifrin, P.E.





Overview of Lost Lake Dam

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

LOST LAKE DAM, I.D. No. 10212

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PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

LOST LAKE DAM, Missouri Inv. No. 10212

SECTION 1: PROJECT INFORMATION

1.1 General

a. Authority

The Dam Inspection Act, Public Law 92-367 of August, 1972, authorizes the Secretary of the Army, through the Corps of Engineers, to initiate a national program of dam inspections. Inspection for the Lost Lake Dam was carried out under Contract DACW 43-79-C-0075 to the Department of the Army, St. Louis District, Corps of Engineers, by the engineering firms of Consoer, Townsend & Associates Ltd., and Engineering Consultants, Inc. (A Joint Venture), of St. Louis, Missouri.

b. Purpose of Inspection

The visual inspection of the Lost Lake Dam was made on June 15, 1979. The purpose of the inspection was to make a general assessment as to the structural integrity and operational adequacy of the dam embankment and its appurtenant structures.

c. Scope of Report

This report summarizes available pertinent data relating to the project; presents a summary of visual observations made during the field inspection; presents an assessment of hydrologic and hydraulic conditions at the site; presents an assessment as to the structural adequacy of the various project features; and assesses the general condition of the dam with respect to safety.

Subsurface investigations, laboratory testing, and detailed analyses were not within the scope of this study. The conclusions drawn herein, therefore, are based on the presence of, or absence of, obvious signs of distress. No warranty as to the absolute safety of the project features is implied by the conclusions presented in this report.

It should be noted that reference in this report to left or right abutments is as viewed looking downstream. Where left abutment or left side of the dam is used in this report, this also refers to west abutment or side, and right to the east abutment or side.

d. Evaluation Criteria

Criteria used to evaluate the dam were furnished by the Department of the Army, Office of the Chief of Engineers, in "Recommended Guidelines for Safety Inspection of Dams", Appendix D. These guidelines were developed with the help of several Federal agencies and many State agencies, professional engineering organizations, and private engineers.

1.2 Description of the Project

a. Description of Dam and Appurtenances

The following description is based exclusively on the original design drawings, observations and measurements made during visual inspection. No "as-built" drawings were available during the preparation of this report.

The dam consists of a homogenous earthfill embankment between earthen abutments. The crest is 14 feet wide and 750 feet long as shown on available drawings. Field measurements show the crest length to be 788 feet. The crest elevation, according to the drawings, is 635.0 feet above MSL. From field measurements, the crest elevation was found to be 637.0 feet above MSL. The maximum height of the embankment is 33.5 feet.

The upstream and downstream slopes are 1V to 3H and 1V to 2H, respectively. According to the available drawings, an 8-foot wide berm was constructed on the upstream slope at an elevation of 617.0 feet above MSL.

A cutoff trench, with side slopes of 1V to 1H and a base width of 20 feet, was excavated parallel to the dam axis. According to Mr. Elmer Glosier, one of the owners of the dam, the trench was excavated to the rock foundation.

There are two spillways for the Lost Lake Reservoir. The principal spillway is located 100 feet to the east from the left abutment. The spillway is a 33-inch inside diameter reinforced concrete drop inlet structure which connects to a 24-inch inside diameter reinforced concrete pipe which passes under the embankment. According to the drawings,

the 24-inch reinforced concrete pipe is 148 feet long with a maximum slope of 8.4%. A 28-inch tall by 11-foot long concrete wall was constructed across the center of the drop inlet as an anti-vortex device. The concrete wall was constructed from the outside edge of the drop inlet across the opening of the drop inlet and into the embankment. A metal framework structure over the drop inlet was provided as a trashrack.

The emergency spillway is cut into the left abutment. The spillway is a grass-lined open channel with side slopes of 1V to 4H and a bottom width of 90 feet.

According to the plans, a 1-1/2-inch diameter galvanized steel pipe was provided as a livestock water supply. The intake is a low-water intake. The discharge control is a gate valve located 40 feet from the downstream end of the pipe. The gate valve is housed in a clay pipe.

A 6-inch diameter perforated helical metal pipe was provided in the embankment as an interceptor drain. The outlet of the drain is located 218 feet to the right of the centerline of the outlet to the drop inlet. According to the drawings, the drain was placed parallel to the crest extending 61 feet to the right of the drain outlet and 233 feet to the left of the drain outlet.

b. Location

The Lost Lake Dam is located on the headwaters of Lost Creek, Lincoln County, Missouri. The nearest downstream community is Elsberry, population 1,398, which is approximately 4.5 miles downstream. The dam and reservoir are shown on the Lockett Ridge Quadrangle Sheet (7.5 minute series) in Section 7, Township 50 North, Range 2 East.

c. Size Classification

According to the "Recommended Guidelines for Safety Inspection of Dams", by the U.S. Department of the Army, Office of the Chief Engineer, the dam is classified in the dam size category as being "Small" since its storage is less than 1,000 acre-feet. The dam is also classified as "Small" in dam height category because its height is less than 40 feet. The overall size classification is, accordingly, "Small" in size.

d. Hazard Classification

The dam has been classified as having "High" hazard potential in the National Inventory of Dams, on the basis that in the event of failure of the dam or its appurtenances, excessive damage could occur to downstream property, together with the possibility of the loss of life. Our findings concur with the classification. Within the estimated damage zone, which extends approximately 3.5 miles downstream of the dam, are three dwellings, two buildings, and a quarry and plant. The town of Elsberry is approximately 4.5 miles downstream.

e. Ownership

The Lost Lake Dam is owned privately by the Glosier Brothers. The mailing address is The Glosier Brothers, c/o Elmer Glosier, #5 Briarwood Lane, St. Charles, Missouri, 63301.

f. Purpose of Dam

The purpose of the dam is for flood control.

g. Design and Construction History

The available records show that the dam was designed in April 1955, by the Department of Agriculture, Soil Conservation Service as part of the Lost Creek Watershed Protection Project. The design engineer's name, as listed on the plans, is Mr. Browning. The dam was built in 1955-56 by Ray & Briscoe, a local construction company.

h. Normal Operational Procedures

Normal procedure is to allow the flood control reservoir to remain as full as possible with the water level being controlled by rainfall, runoff, evaporation and the elevation of the spillway crest.

1.3 Pertinent Data*

a.	Drainage Area (square miles):	1.06
b.	Discharge at Damsite	
	Estimated experienced maximum flood (cfs):	60
	Estimated ungated spillway capacity at maximum pool elevation (cfs):	5495
c.	Elevation (Feet above MSL)	
	Top of dam:	637
	Spillway crest:	
	Principal Spillway	617
	Emergency Spillway	630.75
	Normal Pool	617
	Maximum Pool(PMF):	637.69
d.	Reservoir	
	Length of maximum pool (Feet):	2800
e.	Storage (Acre-Feet)	
	Top of dam:	669
	Spillway crest:	
	Principal Spillway	72
	Emergency Spillway	414
	Normal Pool:	72
	Maximum Pool (PMF):	702
f.	Reservoir Surface (Acres)	
	Top of dam:	46
	Spillway crest:	
	Principal Spillway	15
	Emergency Spillway	36

Normal Pool:	15
Maximum Pool(PMF):	46.5

g. Dam

Type:	Earthfill
Length:	788 feet
Structural Height:	33.5 feet
Hydraulic Height:	33.5 feet
Top width:	14.0 feet
Side slopes:	
Downstream	1V to 2H
Upstream	1V to 3H
Zoning:	Homogeneous
Impervious core:	NA
Cutoff:	Cutoff trench with 20-foot bottom width and 1V to 1H side slopes.
Grout curtain:	Unknown

h. Diversion and Regulating Tunnel None

i. Spillway

Type:	
Principal Spillway	Drop Inlet, Uncontrolled
Emergency Spillway	Open Channel, Uncontrolled
Length of weir:	
Principal Spillway	12.3 feet (Drop inlet spillway)
Emergency Spillway	90 feet
Crest Elevation (feet above MSL):	
Principal Spillway	617.0
Emergency Spillway	630.75

j. Regulating Outlets

Type:	1 1/2-inch diameter galvanized steel pipe livestock water supply
Length:	204 feet (According to Plans)
Closure:	Gate valve at downstream end
Maximum Capacity:	Unknown

* The term "maximum pool", as used in this section, refers to pool level at top of dam elevation unless otherwise specified.

SECTION 2 : ENGINEERING DATA

2.1 Design

Design drawings are available from the Department of Agriculture, Soil Conservation Service, and are included as part of this report. The drawings were prepared in April of 1955 by the Department of Agriculture, Soil Conservation Service. No specifications, engineering computations or soil data for this project were available. No "As-Built" drawings were available during the preparation of this report.

2.2 Construction

No data is available concerning the construction of the dam and appurtenant structures, other than the construction history given in Section 1.2g.

2.3 Operation

No operation records are available for the Lost Lake Dam.

2.4 Evaluation

a. Availability

The availability of engineering data is poor and consists only of the design drawings mentioned in Section 2.1, State Geological Maps and U.S.G.S. Quadrangle Sheets. "As-built" drawings, geologic and soil mechanics reports for this dam can be obtained from the Department of Agriculture, Soil Conservation Service. However, they were not available during the preparation of this report. No information on design hydrology, or hydraulic design was available, nor were seepage and stability analyses comparable to the requirements of the "Recommended Guidelines for Safety Inspection of Dams", which is considered a deficiency.

b. Adequacy

The conclusions presented in this report are based on field measurements, the available engineering data, past performance and present condition of the dam. The data available is inadequate to evaluate the hydraulic and hydrologic capabilities of the dam. In the absence of seepage and stability analyses no quantitative evaluation of the structural stability can be made.

c. Validity

Only a set of design drawings was available for review. From field measurements, the dam appears to have been constructed according to the available drawings, except for the discrepancies described in Section 1.2a. Lost Lake Dam was originally Flood Detention Structure No. 1 according to the design drawings provided by the Soil Conservation Service.

SECTION 3: VISUAL INSPECTION

3.1 Findings

a. General

A visual inspection of the Lost Lake Dam was made on June 15, 1979. The following persons were present during the inspection:

<u>Name</u>	<u>Affiliation</u>	<u>D. sciplines</u>
David J. Kerkes	Engineering Consultants, Inc.	Soils
Peter Howard	Engineering Consultants, Inc.	Geology
Mark R. Haynes	Engineering Consultants, Inc.	Civil, Structural and Mechanical
Kenneth L. Bullard	Engineering Consultants, Inc.	Hydraulics and Hydrology
Kevin Blume	Consoer, Townsend & Assoc., Ltd.	Civil and Structural
Elmer Glosier	Owner	
Robert Glosier	Owner	

Specific observations are discussed below.

b. Dam

The crest of the dam is well protected against surface erosion by a well maintained cover of grass. There was no evidence of significant settlement or cracking on the crest. No significant deviations in horizontal or vertical alignment were apparent. According to Mr. Robert Glosier, the water level has never been higher than 8 feet up the slope above the principal spillway. Therefore, the emergency spillway has not been used and the dam has not been overtopped.

The upstream slope had no evidence of riprap protection. Some minor erosion has occurred on the slope near the water surface due to wave action. According to Mr. Robert Glosier, the Glosier Brothers have tried to stop the erosion from doing further damage to the slope by planting canary reed grass along the shoreline. The slope appeared to be well maintained. No depressions or settlements were apparent on the slope.

The downstream slope of the embankment has a heavy grass cover. According to Mr. Elmer Glosier, a slide on the slope occurred shortly after construction. The slide area is located on the upper half of the slope and immediately to the right of the principal spillway outlet. The damaged area was approximately 20 to 25 feet wide and did not extend to the crest. The slide was shallow in depth. Some minor erosion was observed on the downstream embankment near the fence on the left abutment. No other depressions, bulges or settlements were apparent on the downstream slope. No seepage was apparent along the toe of the slope. Materials removed

immediately below the vegetation cover on the embankment appeared to be a clayey silt. The interceptor drain outlet was covered and the drain has not discharged to the best of Mr. Elmer Glosiers' knowledge.

According to the "Missouri General Soil Map and Soil Association Descriptions" published by the Soil Conservation Service, the materials in the general area of the dam are classified as a Lindley silt loam of the Central Mississippi Valley Wooded Slopes family. The Lindley silt may be susceptible to excessive erosion. If the Lindley silt was used in the embankment, the embankment may be susceptible to erosion and failure should overtopping result during a flood.

There are no signs of rodent activity in either the embankment or the abutments, but there is some muskrat activity in the reservoir area. According to Mr. Robert Glosier, the muskrats are trapped annually.

c. Project Geology

The dam is situated in the Dissect Till Plains Section of the Central Lowlands Province (Fenneman, N.M., "Physiography of Eastern United States", 1946). In the area of the dam site, however, much of the till has been removed by erosion. The entire area exhibits a karst topography with frequent sink holes.

The rocks in the area dip regionally to the northeast off the Ozark uplift to the south. Rocks ranging in age from Ordovician to Pennsylvanian occur in the general area.

At the dam site, limestones of the Plattin Formation (Ordovician) (Geologic Map of Missouri, 1979) occur. The rocks outcropping near the downstream toe consist of light gray, crystalline, dense limestone. The rock is massive and often forms escarpments of five feet or more. Higher stratigraphically, at about the elevation of the dam, a dense, gray sub-lithographic limestone crops out. No dip could be measured in the beds in the vicinity of the dam. The entire area exhibits a karst topography with frequent sink holes.

d. Appurtenant Structures

(1) Spillways

The concrete drop inlet structure is in good condition. No spalling or cracking of the concrete was observed. The trashrack was in good condition and unplugged. The concrete anti-vortex device was also in good condition with no spalling or cracking of the concrete observed. Leakage in the 24-inch diameter concrete pipe was detected. The leakage appeared to be in the drop inlet structure because the upstream invert of the structure had standing water in it. A flow of less than 1 gpm was observed at the outlet of the conduit. No spalling or cracking of the concrete in the conduit was observed. The joints of the exposed portion of the conduit showed no sign of misalignment. The area around the intake to the principal spillway was overgrown with tall grass.

The emergency spillway was heavily covered with grass. The emergency spillway channel was not obstructed. No indication of instability in the slopes was apparent. However, the slope on the left side of the spillway is being eroded by grazing cattle.

(2) Outlet Works

No regulated outlet works were provided for the Lost Lake Dam except for a livestock watering system. The inlet and outlet of the system were not located. The gate valve clay pipe housing was located at the toe of the downstream slope approximately 200 feet to the right of the principal spillway outlet. The gate valve was accessible, however, according to Mr. Elmer Glosier, the system is no longer used.

e. Reservoir Area

The water surface elevation was 616.8 feet above MSL on the day of the inspection.

The reservoir rim is gently sloped and no indication of instability or severe erosion were readily apparent. The slopes above the reservoir are heavily grassed. A few houses are built around the reservoir rim.

f. Downstream Channel

The downstream channel of the principal spillway is a well-defined, narrow rock lined channel. The channel was not obstructed. The channel extends for a few hundred feet downstream and then flows into an open grassy pasture.

The downstream channel of the emergency spillway is a well-defined, grass lined channel which was not obstructed. The channel is approximately 220 feet long and then it flows into an open grassy pasture.

3.2 Evaluation

The visual inspection did not reveal any items which are sufficiently significant to indicate a need for immediate remedial action.

The following conditions were observed which could affect the safety of the dam or which will require maintenance within a reasonable period of time.

1. Minor erosion of the upstream slope near the water surface.
2. Eroded area on the embankment near the left abutment.
3. The tall grass around the intake to the principal spillway.

SECTION 4: OPERATIONAL PROCEDURES

4.1 Procedures

Lost Lake Dam was built to impound water for flood control as part of the Lost Creek Watershed Protection Project. The only operating facility is a livestock watering system which, according to Mr. Elmer Glosier, is no longer used. The water level is controlled by rainfall, runoff, evaporation and the spillway crest elevation.

4.2 Maintenance of Dam

The dam is maintained by the owners, the Glosier Brothers. The maintenance of the dam appears to be adequate. The upstream slope and the crest are mowed semiannually, however, due to the steepness of the downstream slope, the downstream slope is not mowed. Trees and bushes are kept off of the embankment. There have not been any major repairs done to the dam itself since its original construction.

4.3 Maintenance of Operating Facilities

The only operational facility at the damsite is the livestock watering system. The livestock watering system is no longer used.

4.4 Description of Any Warning System in Effect

The inspection team was not informed of any warning system in effect for this dam.

4.5 Evaluation

The maintenance for Lost Lake Dam seems to be adequate, however, the remedial measures as described in Section 7 should be undertaken.

SECTION 5: HYDRAULIC/HYDROLOGIC

5.1 Evaluation of Features

a. Design

The watershed area of the Lost Lake Dam upstream from the dam axis consists of approximately 676 acres. Most of the watershed area is wooded and covered with grass. Land gradients in the higher regions of the watershed average roughly 12 percent, and in the lower areas surrounding the reservoir average about 6 percent. The Lost Lake Dam is located on the Lost Creek about 1.3 miles downstream of the extreme headwaters of the creek. At its longest arm the watershed is approximately 1.3 miles long. A drainage map showing the watershed area is presented as Plate 1 in Appendix B.

Evaluation of the hydraulic and hydrologic features of Lost Lake Dam was based on criteria set forth in the Corps of Engineers' "Recommended Guidelines for Safety Inspection of Dams", and additional guidance provided by the St. Louis District of the Corps of Engineers. The Probable Maximum Flood (PMF) was calculated from the Probable Maximum Precipitation (PMP) using the methods outlined in the U.S. Weather Bureau Publication, Hydrometeorological Report No. 33. The probable maximum storm duration was set at 24 hours, and storm rainfall distribution was based on criteria given in EM 1110-2-1411 (Standard Project Storm). The SCS method was used for deriving the unit hydrograph, utilizing the Corps of Engineers' computer program HEC-1 (Dam Safety Version). The unit

hydrograph parameters are presented in Appendix B. The SCS method was also used for determining loss rate. The hydrologic soil group of the watershed was determined by use of published soil maps. The hydrologic soil group of the watershed and the SCS curve number are also presented in Appendix B. The curve number, unit hydrograph parameters, PMF index rainfall and the percentages for various durations were directly input to the HEC-1 (Dam Safety Version) computer program to obtain the PMF hydrograph. The computed peak discharge of the PMF and one-half of the PMF are 10,568 cfs and 5,284 cfs, respectively.

Both the PMF and one-half of the PMF inflow hydrographs were routed through the reservoir by the Modified Puls Method also utilizing the HEC-1 (Dam Safety Version) computer program. The reservoir level was assumed at the principal spillway crest level at the start of the routing computation. The peak outflow discharges for the PMF and one-half of the PMF are 7,620 and 1,993 cfs, respectively. Only the PMF, when routed through the reservoir, results in overtopping of the dam.

The stage-outflow relation for the spillway was prepared from field notes and sketches prepared during the field inspection and limited design drawings. The reservoir stage-capacity data was based on the U.S.G.S. Luckett Ridge, Missouri Quadrangle topographic map (7.5 minute series). The spillway and overtop rating curve and the reservoir capacity curve are presented in Plates 2 & 3, respectively, in Appendix B.

From the standpoint of dam safety, the hydrologic design of a dam aims at avoiding overtopping. Overtopping is especially dangerous for an earth dam because the downrush of waters over the crest can erode the dam embankment and release all the stored water suddenly into the downstream floodplain. The safe hydrologic design of a dam requires a spillway crest height that can handle a very large and exceedingly rare flood without overtopping.

The Corps of Engineers designs its dams to safely pass the Probable Maximum Flood that is estimated could be generated from the upstream watershed. This is the generally accepted criterion for major dams throughout the world, and is the standard for dam safety where overtopping would pose any threat to human life. According to the Corps' criteria, the hydrologic requirement for safety for this dam is the capability to pass from one-half of the Probable Maximum Flood to the Probable Maximum Flood without overtopping.

b. Experience Data

No records of reservoir stage or spillway discharge are maintained for this site. Nevertheless, according to the owners, the maximum reservoir level was about 8 feet up the slope above the crest of the principal spillway.

c. Visual Observations

Observations made of the spillway during the visual inspection are discussed in Section 3.1c(1) and evaluated in Section 3.2.

d. Overtopping Potential

As indicated in Section 5.1-a, only the Probable Maximum Flood, when routed through the reservoir, results in overtopping of the dam. The PMF overtopped the dam crest by 0.69 feet. The spillway/reservoir system can accomodate one-half of the PMF with a freeboard of 2.88 feet. The total duration of embankment overflow is 0.42 hours during the PMF. The spillway and the reservoir of Lost Lake Dam are capable of accomodating a flood equal to approximately 81 percent of the PMF just before overtopping the dam. The 100-year flood is equal to approximately 15 percent of the PMF. The spillway/reservoir system will accomodate the 100-year flood without overtopping the dam.

The failure of the dam could cause extensive damage to the property downstream of the dam and possible loss of life. Within 3.1 miles downstream of the dam are three dwellings, two buildings and a quarry and plant. The town of Elsberry lies about 4.5 miles downstream.

SECTION 6: STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Observations

There were no signs of settlement or distress observed on the embankment or foundation during the visual inspection. The slide area on the downstream slope appears to be stable and is not serious enough to indicate an unsafe condition. According to Mr. Elmer Glosier, a professional engineer viewed the slide area shortly after the slide occurred. The professional engineer determined that the damaged area had no significant effect on the overall stability of the slope and that the slope had stabilized. According to Mr. Elmer Glosier, no other slides have occurred on the slope.

The minor erosion of the upstream slope due to wave action was not serious enough to constitute an unsafe condition. According to Mr. Robert Glosier, canary reed grass has been planted along the shoreline to prevent further erosion of the slope. Nevertheless, the erosion should be monitored and if the erosion continues, steps should be taken to control the problem.

Neither the principal spillway drop inlet nor the 24-inch reinforced concrete discharge pipe exhibited any evidence of misalignment or structural instability. The seepage observed at the outlet of the pipe is felt to have no significant effect on the structural stability of the dam. Nevertheless, the seepage should be monitored and any changes

in quantity or color should be reported and investigated.

The eroded area on the embankment near the left abutment was not serious enough to constitute an unsafe condition. The erosion of the left side slope of the emergency spillway does not constitute an unsafe condition because if the erosion is allowed to continue it will just erode into the natural ground. This condition will not decrease the emergency spillway discharge capacity or affect the stability of the side slopes of the spillway. Also, this condition will not cause any instability in the dam embankment.

b. Design and Construction Data

No design computations were uncovered during the report preparation phase. Seepage and stability analyses comparable to the requirements of the "Recommended Guidelines for Safety Inspection of Dams" was not available. No embankment or foundation soil parameters are available for carrying out a conventional stability analysis on the embankment. No construction data or specifications relating to the degree of embankment compaction are available for use in a stability analysis.

c. Operating Records

No operating records are available relating to the stability of the dam or appurtenant structures. The water level on the day of inspection was near the crest of the principal spillway, and it is assumed that the reservoir remains close to full at all times. No regulated outlet works exists at the damsite except for the livestock watering system. The system is no longer used.

d. Post Construction Changes

No post construction changes exist which will affect the structural stability of the dam.

e. Seismic Stability

The dam is located in seismic Zone 1, as defined in "Recommended Guidelines for Safety Inspection of Dams" as prepared by the Corps of Engineers, and therefore, does not require a seismic stability analysis.

SECTION 7: ASSESSMENT/REMEDIAL MEASURES

7.1 Dam Assessment

The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

It should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team.

It is also important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that an unsafe condition could be detected.

a. Safety

The spillway capacity of the Lost Lake Dam was found to be "Inadequate". The spillway/reservoir system will accommodate 81 percent of the PMF without overtopping the dam. The spillway and the reservoir will accommodate the 100-year flood without overtopping the dam.

The dam embankment appears to be in satisfactory structural condition. The minor erosion due to wave action on the upstream embankment slope is not serious at this time, however, the condition should be monitored and repaired as required.

The slide area on the downstream embankment slope has stabilized and was determined by a professional engineer to pose no danger to the stability of the downstream slope. No other signs of distress were observed in the embankment or in the foundation, nor was seepage observed at any location. No seepage and stability analyses were available for review.

The tall grass around the intake to the principal spillway should be cleared and not allowed to grow back. This condition poses an obstacle to the normal operation of the principal spillway. The seepage through the conduit of the principal spillway does not jeopardize the safety of the embankment in its present condition, but it should be monitored for any changes in quantity and color.

The erosion of the left side slope of the emergency spillway does not jeopardize the safety of the embankment in its present location. The erosion of the embankment near the left abutment does not pose any danger to the safety of the embankment in its present condition, but if allowed to continue to erode the embankment it could jeopardize the safety of the embankment.

The muskrat activity in the reservoir area poses no danger to the embankment, but they should be watched and not allowed to burrow into the embankment.

The Platten Formation is relatively competent and is a suitable foundation for the dam. While the possibility exists that leakage through solution channels could occur in such a limestone formation, it is evident that none occurs at this site at this time or that they were sufficiently blanketed during construction.

b. Adequacy of Information

The conclusions presented in this report are based on field measurements, the available engineering data, past performance and present condition of the dam. Information on the design hydrology, hydraulic design, and the operation and maintenance of the dam as well as seepage and stability analyses were not available. To supplement available data and allow for a more definite evaluation of the dam, it is recommended that the following programs be initiated:

1. Periodic inspection of the dam by a professional engineer experienced in the design and construction of earthen dams should be made and this inspection report made a matter of record.
2. Set up a maintenance schedule and log all visits to the dam for operation, repairs and maintenance.
3. Perform seepage and stability analyses comparable to the requirements of the "Recommended Guidelines for Safety Inspection of Dams".

c. Urgency

The remedial measures recommended in paragraph 7.2 should be accomplished within a reasonable period of time.

d. Necessity for Phase II Inspection

Based on results of the Phase I inspection, a Phase II inspection is not felt to be necessary.

7.2 Remedial Measures

Alternatives:

1. Spillway capacity and/or height of the dam should be increased to accomodate the PMF without overtopping the dam. The overtopping depth during the occurence of the PMF, stated elsewhere in the report is not the required or recommended increase in height of the the dam.

O & M Procedures:

1. The following corrective measures should be undertaken within a reasonable period of time.

- (a) Remove tall grass from around intake to the principal spillway and keep the grass from growing back.
- (b) Repair eroded area on the embankment near the crest at the left abutment and protect the area from further damage.

- (c) Seepage and stability analyses should be performed by a professional engineer experienced in the design and construction of dams.

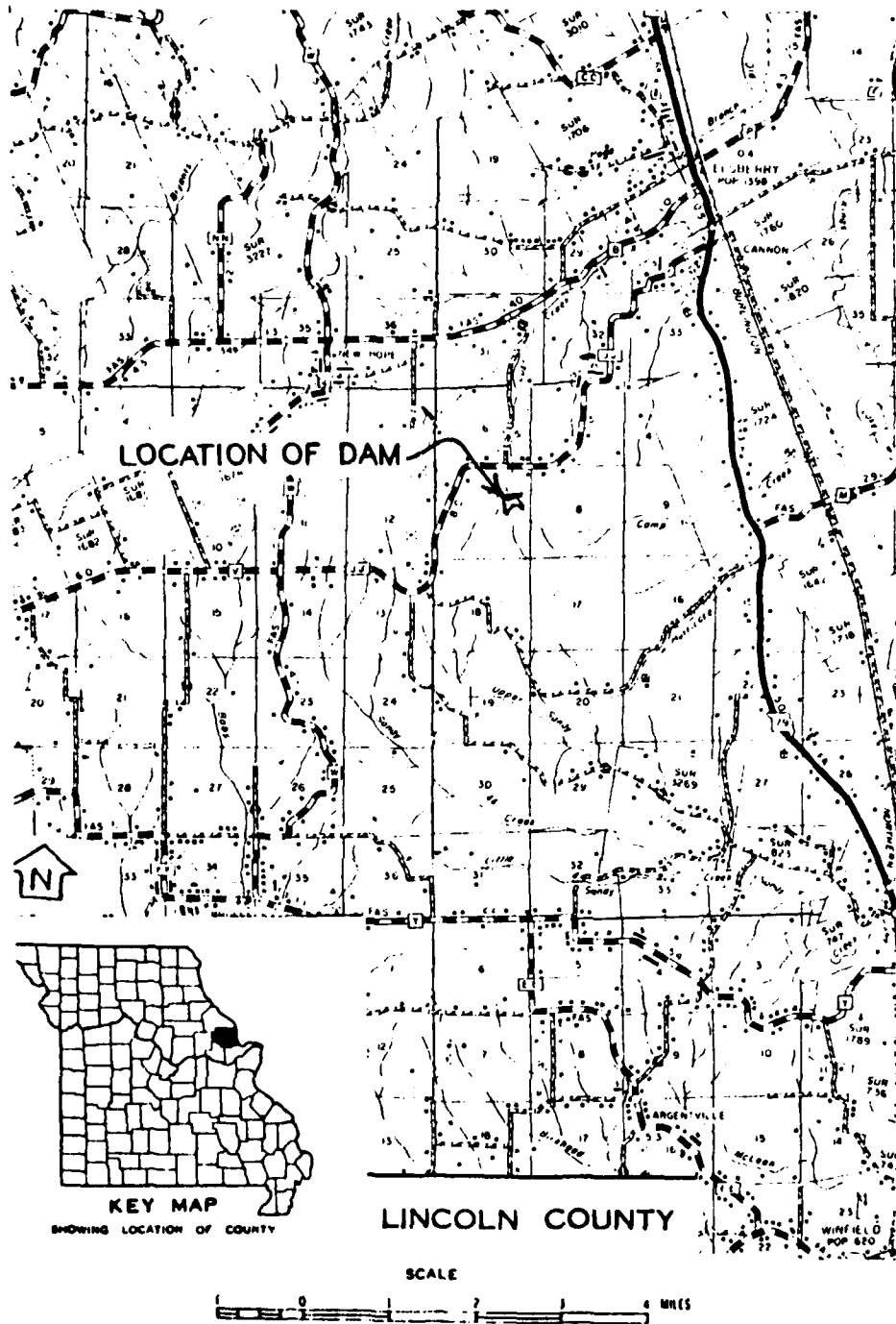
2. The following conditions should be monitored.

- (a) Monitor erosion due to wave action on upstream slope, and if the erosion continues, other protective measures should be employed to protect the slope from further damage.
- (b) Monitor the seepage through the outlet conduit for changes in quantity or color and report any change.

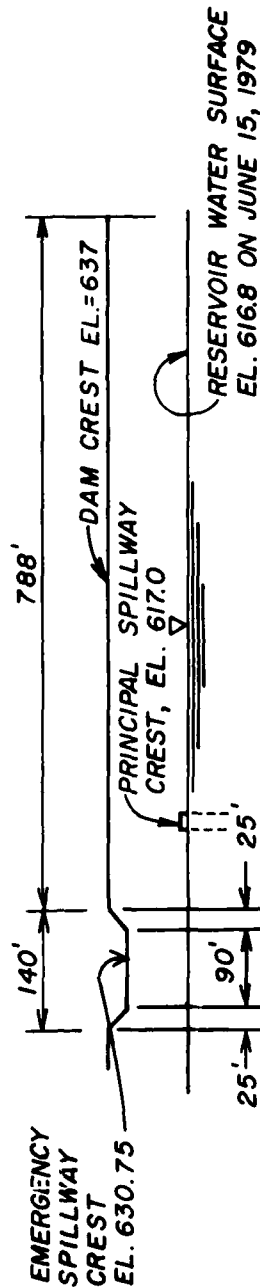
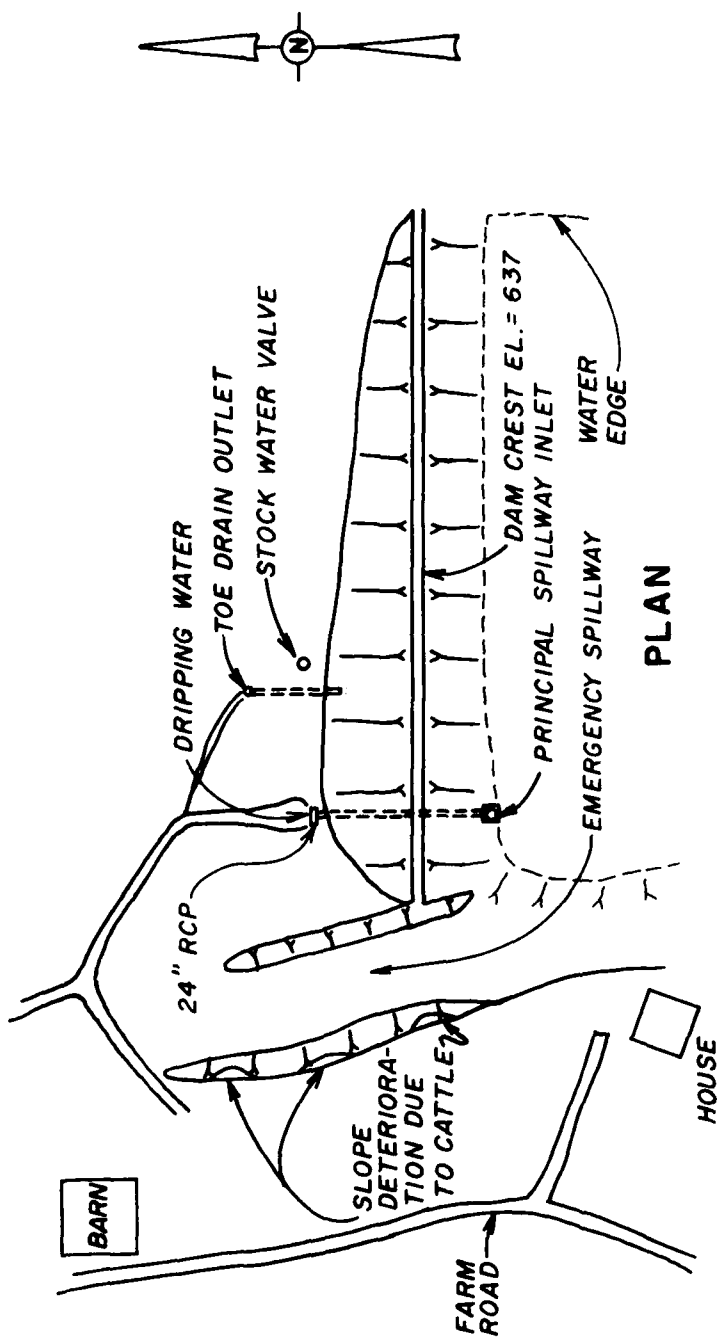
3. The owner should initiate the following programs:

- (a) Periodic inspection of the dam by a professional engineer experienced in the design and construction of earthen dams.
- (b) Set up a maintenance schedule and log all visits to the dam for operation, repairs and maintenance.

PLATES



LOCATION MAP-LOST LAKE DAM



SCALE
1" = 200' (HORIZONTAL)
VERTICAL (NOT TO SCALE)

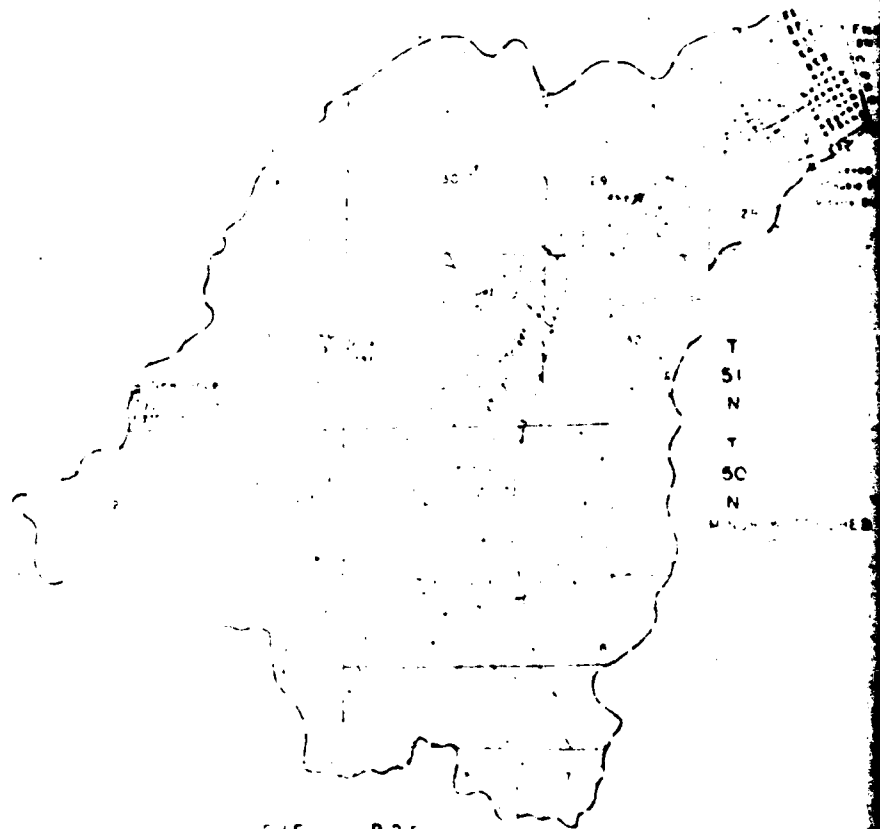
LOST LAKE DAM (MO. 10212)
PLAN & ELEVATION

U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

DETAIL PLANS FOR
LOST CREEK WATERSHED PROTECTION PROJECT

THE SOIL DISTRICT OF LINCOLN COUNTY, MISSOURI

PART I OF
MINOR WATERSHED "E"



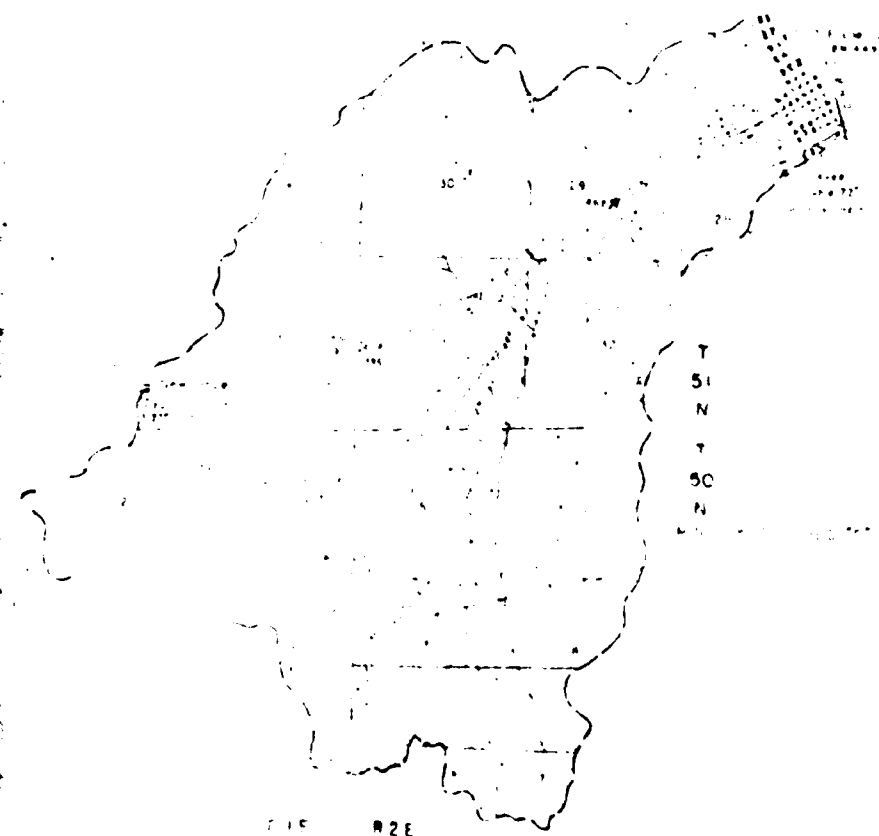
FILE R2E

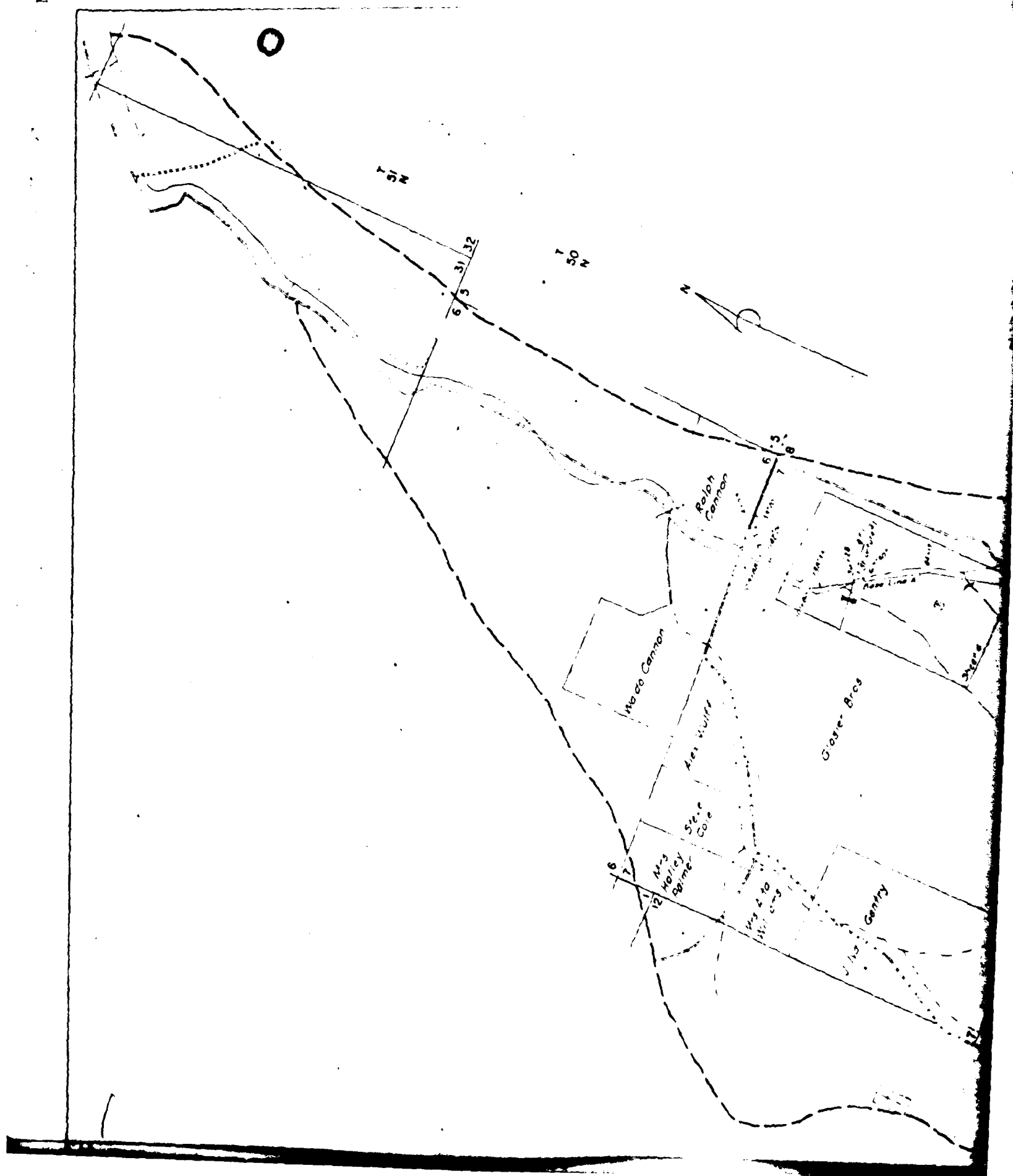
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

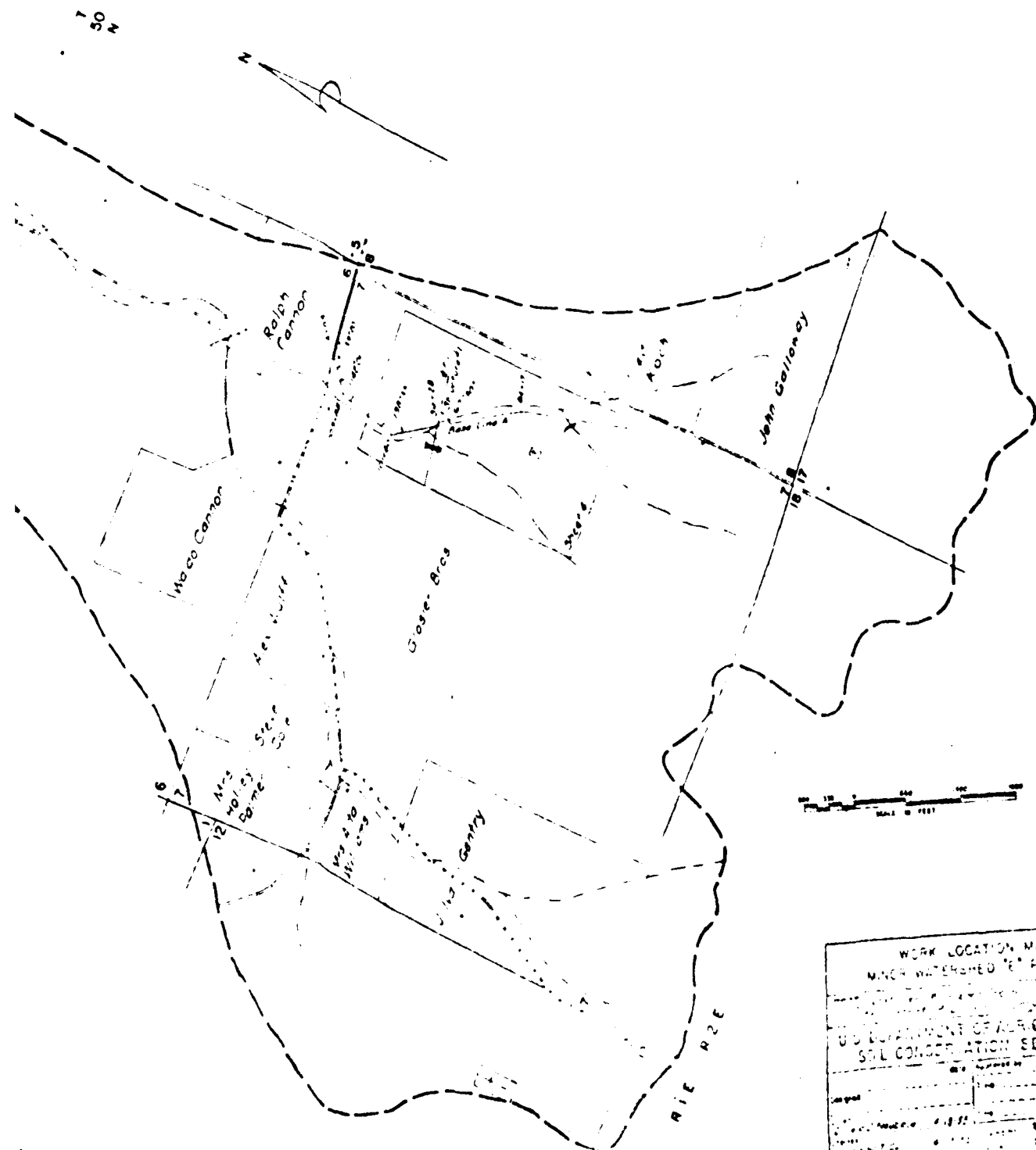
DETAIL PLANS FOR ST CREEK WATERSHED PROTECTION PROJECT

THE SOIL DISTRICT OF LINCOLN COUNTY, MISSOURI

PART I OF
MINOR WATERSHED "E"







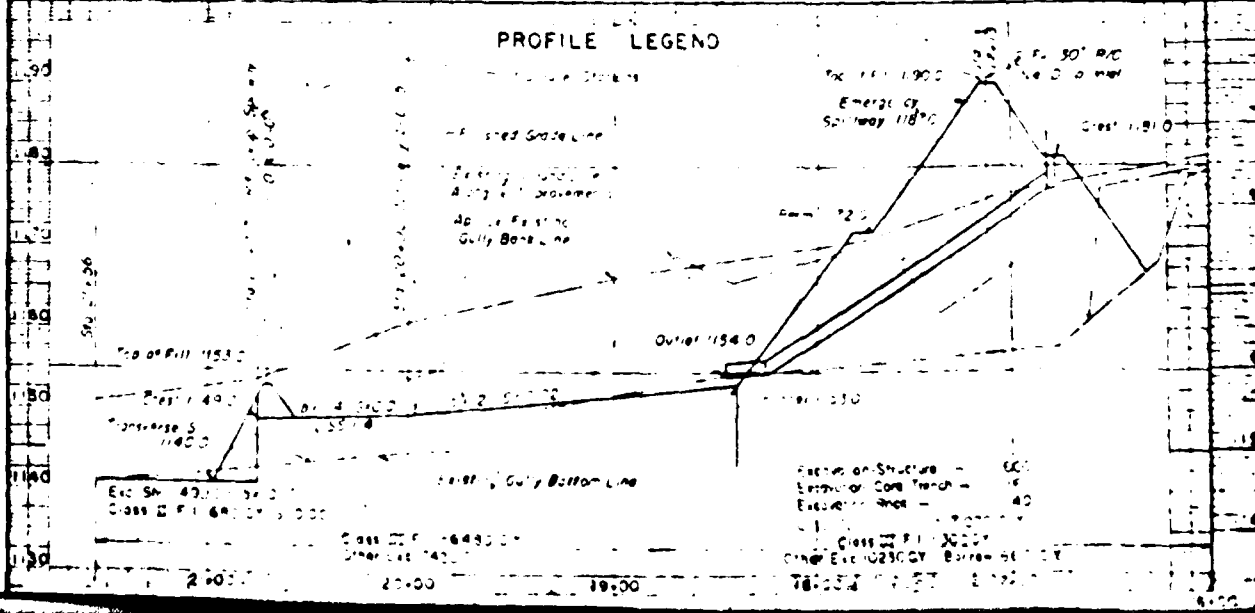
WORK LOCATION MAP	
MINNER WATERSHED "E" PART I	
U.S. DEPARTMENT OF AGRICULTURE	
SOIL CONSERVATION SERVICE	
Map prepared by	
Date	
Project	
Sheet No. 1 of 1	
Scale 1" = 100'	

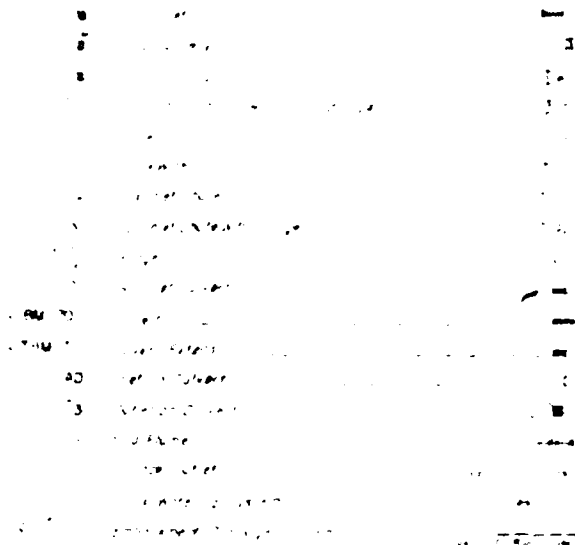
State Line	-----	Gravel	10
County Line	-----	Silt	11
Section Line	-----	Clay	12
Water Course	~~~~~	Sand	13
Water Course	~~~~~	Fine gravel	14
Water Course	~~~~~	Coarse gravel	15
Water Course	~~~~~	Silt and shale	16
Water Course	~~~~~	Coal seam	17
Water Course	~~~~~	Sandstone	18
Water Course	~~~~~	Limestone	19
Water Course	~~~~~	Gneiss or other metamorphic	20
Water Course	~~~~~	Quartzite	21
Water Course	~~~~~	Granite	22
Water Course	~~~~~	Basalt	23
Water Course	~~~~~	Andesite	24
Water Course	~~~~~	Diorite	25
Water Course	~~~~~	Gabbro	26
Water Course	~~~~~	Diabase	27
Water Course	~~~~~	Granodiorite	28
Water Course	~~~~~	Syenite	29
Water Course	~~~~~	Gneiss	30
Water Course	~~~~~	Schist	31
Water Course	~~~~~	Quartzite	32
Water Course	~~~~~	Granite	33
Water Course	~~~~~	Basalt	34
Water Course	~~~~~	Andesite	35
Water Course	~~~~~	Diorite	36
Water Course	~~~~~	Gabbro	37
Water Course	~~~~~	Diabase	38
Water Course	~~~~~	Granodiorite	39
Water Course	~~~~~	Syenite	40
Water Course	~~~~~	Gneiss	41
Water Course	~~~~~	Schist	42
Water Course	~~~~~	Quartzite	43
Water Course	~~~~~	Granite	44
Water Course	~~~~~	Basalt	45
Water Course	~~~~~	Andesite	46
Water Course	~~~~~	Diorite	47
Water Course	~~~~~	Gabbro	48
Water Course	~~~~~	Diabase	49
Water Course	~~~~~	Granodiorite	50
Water Course	~~~~~	Syenite	51
Water Course	~~~~~	Gneiss	52
Water Course	~~~~~	Schist	53
Water Course	~~~~~	Quartzite	54
Water Course	~~~~~	Granite	55
Water Course	~~~~~	Basalt	56
Water Course	~~~~~	Andesite	57
Water Course	~~~~~	Diorite	58
Water Course	~~~~~	Gabbro	59
Water Course	~~~~~	Diabase	60
Water Course	~~~~~	Granodiorite	61
Water Course	~~~~~	Syenite	62
Water Course	~~~~~	Gneiss	63
Water Course	~~~~~	Schist	64
Water Course	~~~~~	Quartzite	65
Water Course	~~~~~	Granite	66
Water Course	~~~~~	Basalt	67
Water Course	~~~~~	Andesite	68
Water Course	~~~~~	Diorite	69
Water Course	~~~~~	Gabbro	70
Water Course	~~~~~	Diabase	71
Water Course	~~~~~	Granodiorite	72
Water Course	~~~~~	Syenite	73
Water Course	~~~~~	Gneiss	74
Water Course	~~~~~	Schist	75
Water Course	~~~~~	Quartzite	76
Water Course	~~~~~	Granite	77
Water Course	~~~~~	Basalt	78
Water Course	~~~~~	Andesite	79
Water Course	~~~~~	Diorite	80
Water Course	~~~~~	Gabbro	81
Water Course	~~~~~	Diabase	82
Water Course	~~~~~	Granodiorite	83
Water Course	~~~~~	Syenite	84
Water Course	~~~~~	Gneiss	85
Water Course	~~~~~	Schist	86
Water Course	~~~~~	Quartzite	87
Water Course	~~~~~	Granite	88
Water Course	~~~~~	Basalt	89
Water Course	~~~~~	Andesite	90
Water Course	~~~~~	Diorite	91
Water Course	~~~~~	Gabbro	92
Water Course	~~~~~	Diabase	93
Water Course	~~~~~	Granodiorite	94
Water Course	~~~~~	Syenite	95
Water Course	~~~~~	Gneiss	96
Water Course	~~~~~	Schist	97
Water Course	~~~~~	Quartzite	98
Water Course	~~~~~	Granite	99
Water Course	~~~~~	Basalt	100



- II**
1. Peat
 2. Silt loam
 3. Silty clay loam
 4. Silty clay
 5. Sandy loam
 6. Silty clay loam
 7. Silty clay
 8. Clay
 9. Sand
 10. Fine gravel
 11. Coarse gravel
 12. Silt and shale
 13. Coal seam
 14. Sandstone
 15. Limestone
 16. Gneiss or other metamorphic
 17. Quartzite
 18. Granite
 19. Basalt
 20. Andesite
 21. Diorite
 22. Gabbro
 23. Diabase
 24. Granodiorite
 25. Syenite
 26. Gneiss
 27. Schist
 28. Quartzite
 29. Granite
 30. Basalt
 31. Andesite
 32. Diorite
 33. Gabbro
 34. Diabase
 35. Granodiorite
 36. Syenite
 37. Gneiss
 38. Schist
 39. Quartzite
 40. Granite
 41. Basalt
 42. Andesite
 43. Diorite
 44. Gabbro
 45. Diabase
 46. Granodiorite
 47. Syenite
 48. Gneiss
 49. Schist
 50. Quartzite
 51. Granite
 52. Basalt
 53. Andesite
 54. Diorite
 55. Gabbro
 56. Diabase
 57. Granodiorite
 58. Syenite
 59. Gneiss
 60. Schist
 61. Quartzite
 62. Granite
 63. Basalt
 64. Andesite
 65. Diorite
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 67. Diabase
 68. Granodiorite
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 72. Quartzite
 73. Granite
 74. Basalt
 75. Andesite
 76. Diorite
 77. Gabbro
 78. Diabase
 79. Granodiorite
 80. Syenite
 81. Gneiss
 82. Schist
 83. Quartzite
 84. Granite
 85. Basalt
 86. Andesite
 87. Diorite
 88. Gabbro
 89. Diabase
 90. Granodiorite
 91. Syenite
 92. Gneiss
 93. Schist
 94. Quartzite
 95. Granite
 96. Basalt
 97. Andesite
 98. Diorite
 99. Gabbro
 100. Diabase

* Dashed lines indicate existing contours or gully bottoms within a cut of excavation, etc.
 NOTE: These symbols are used primarily on the more detailed maps, where applicable they may be shown on the plans.





- II** Soils
- 1 Peat
 - 2 Silt loam
 - 3 Silty clay loam
 - 4 Silty clay
 - 5 Sandy loam
 - 6 Clay loam
 - 7 Sandy clay
 - 8 Clay
 - 9 Sand
 - 10 Fine gravel
 - 11 Coarse gravel
 - 12 Silt and shale
 - 13 Limestone
 - 14 Sandstone
 - 15 Limestone
 - 16 Glacial drift (periglacial)
 - 17 Glacial drift (periglacial)

Using either the designation number, number or symbol representing the soil type

Method No. 2

Using Mechanical Analysis

(Gravel, sand, silt, clay)

0-10-76-6

0-28-64-8

0-20-65-14



DIVERSIONS & EMERGENCY SPILLWAYS

DEFINITIONS OF TERMS

- a - grade of channel interior of drop perpendicularity
- b - bottom of channel interior
- c - side slope of channel interior
- d - top of channel interior
- e - top of channel exterior
- f - bottom of channel exterior
- g - side slope of channel exterior
- h - top of channel exterior

TABLE OF STANDARD DIMENSIONS

Improvement	7	55
Improved Drainage	6	31
Drainage	6	31
Levees	6	31 or As shown on plans
Drop Inlet Embankments	6	31 or As shown on plans
Gate Embankments	6	31
Drop Spillway Embankments	6	31 upstream - 21 downstream

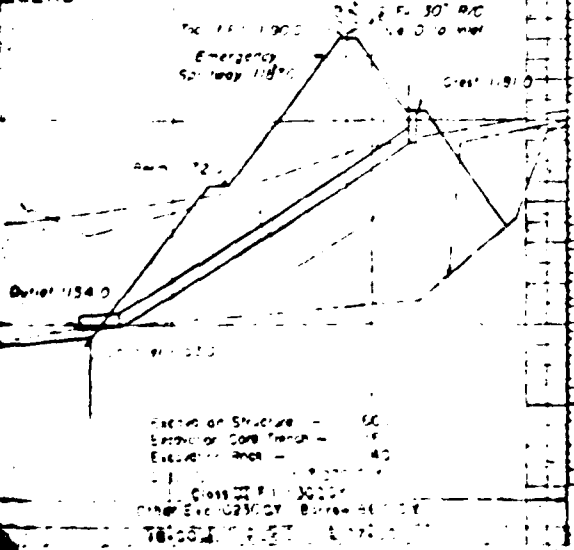
Note 1 Use standard dimensions unless otherwise shown on plans

2 Use a, b, and FH as shown on plans

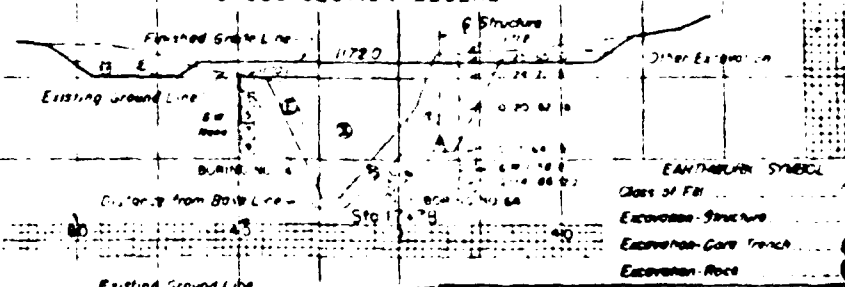
GENERAL NOTES

- 1 Improvements are along Base Line unless otherwise indicated
- 2 Elevations of pipes refer to invert elevations
- 3 Cross sections shown as looking downstream
- 4 Lines showing limits of structure excavation are on a 1:1 slope unless otherwise indicated

LEGEND



CROSS SECTION LEGEND



LEGEND & INFORMATION

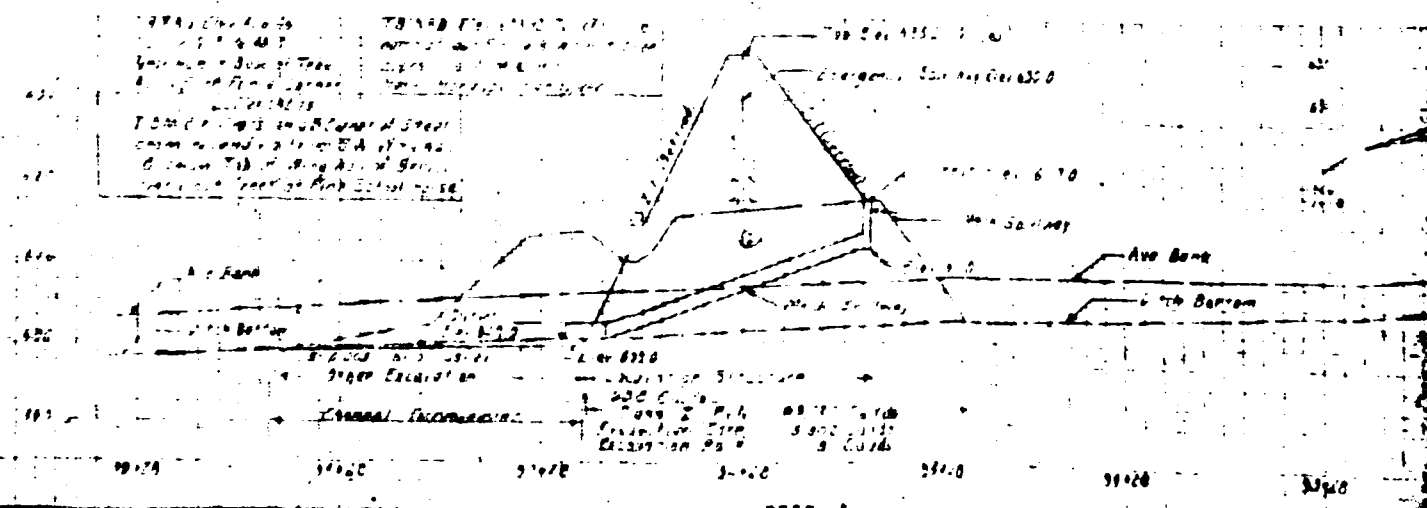
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SOIL CONSERVATION SERVICE

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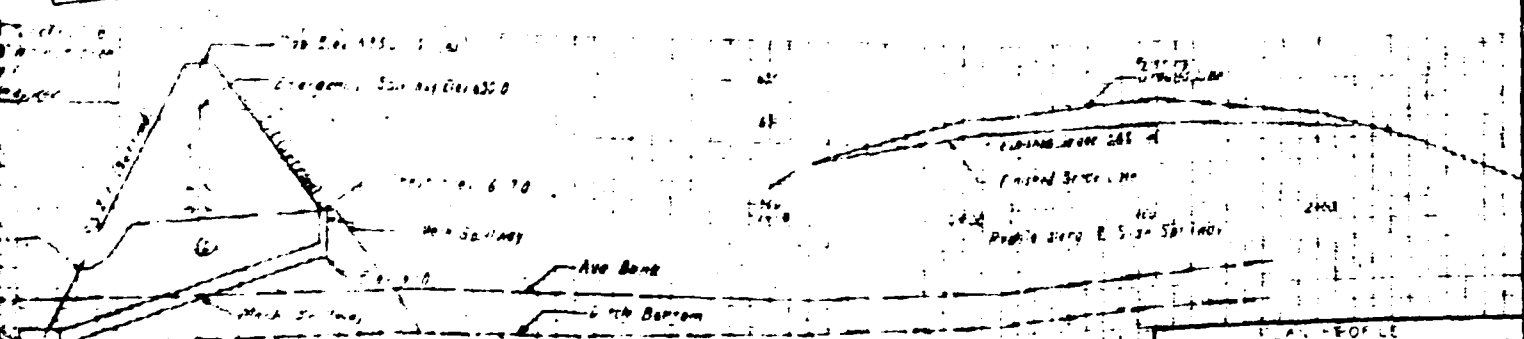
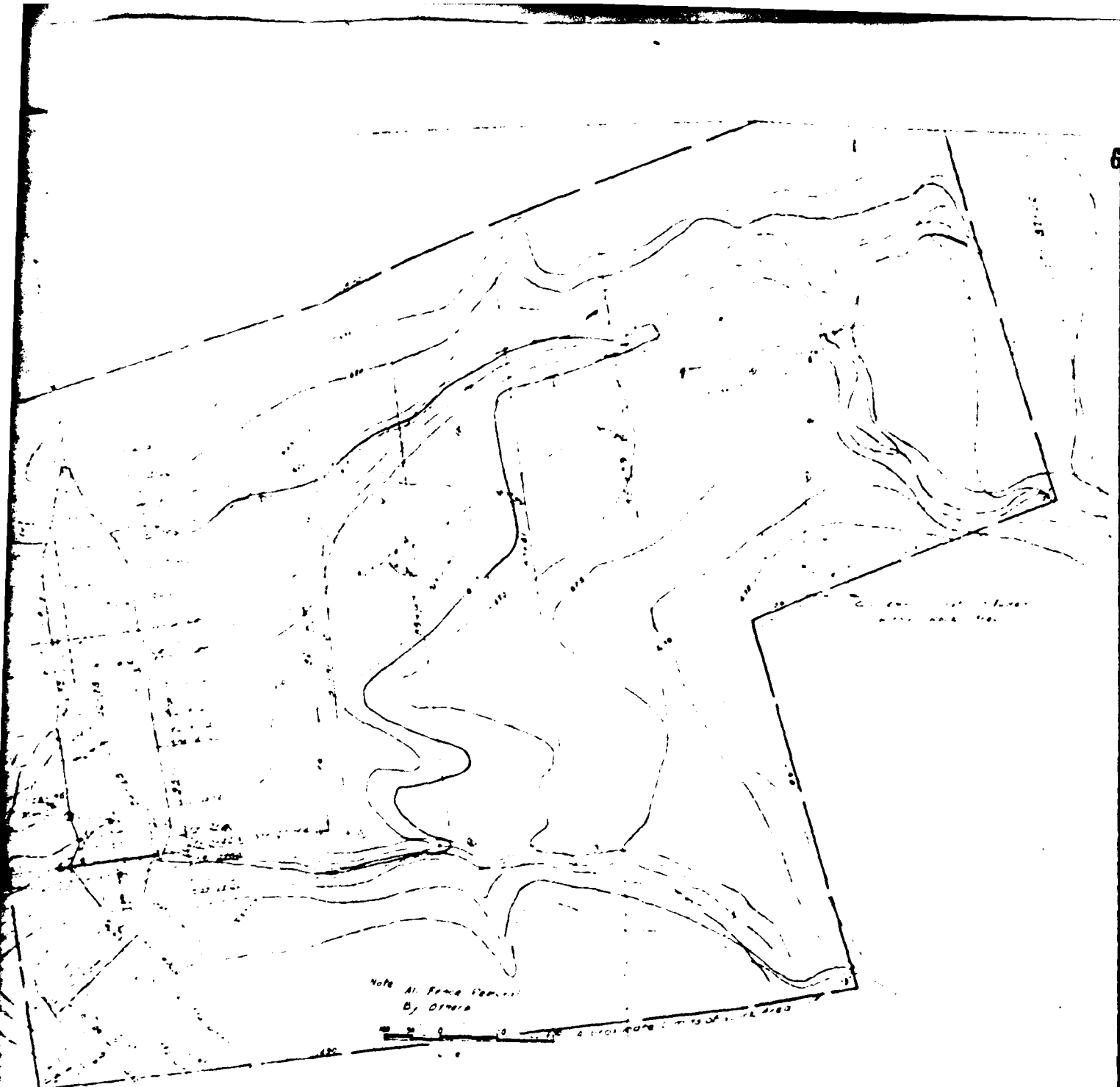


Note: All Fences Removed
By Owners

1. 100' x 100' x 100' x 100'
2. 100' x 100' x 100' x 100'
3. 100' x 100' x 100' x 100'
4. 100' x 100' x 100' x 100'
5. 100' x 100' x 100' x 100'



100' 100' 100' 100' 100' 100' 100' 100' 100' 100'



1. 100 8120
 2. 100 8120
 3. 100 8120
 4. 100 8120
 5. 100 8120
 6. 100 8120
 7. 100 8120
 8. 100 8120
 9. 100 8120
 10. 100 8120

PLAN - PROFILE			
STA 100+00 TO STA 100+50 JULY 1950			
U.S. DEPARTMENT OF AGRICULTURE			
SOIL CONSERVATION SERVICE			
DESIGNED BY	CHECKED BY	DATE	SCALE
100 8120	100 8120	100 8120	100 8120

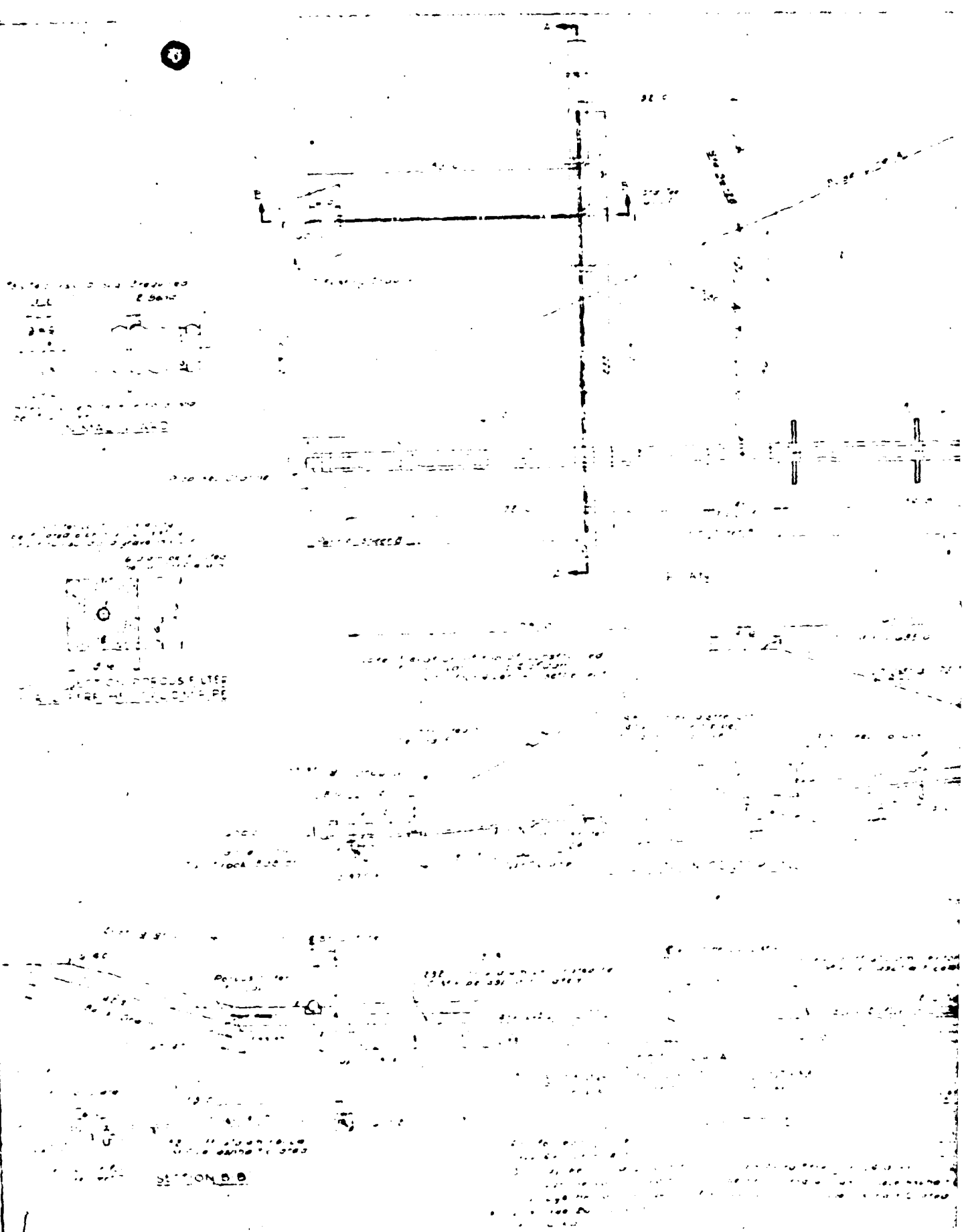
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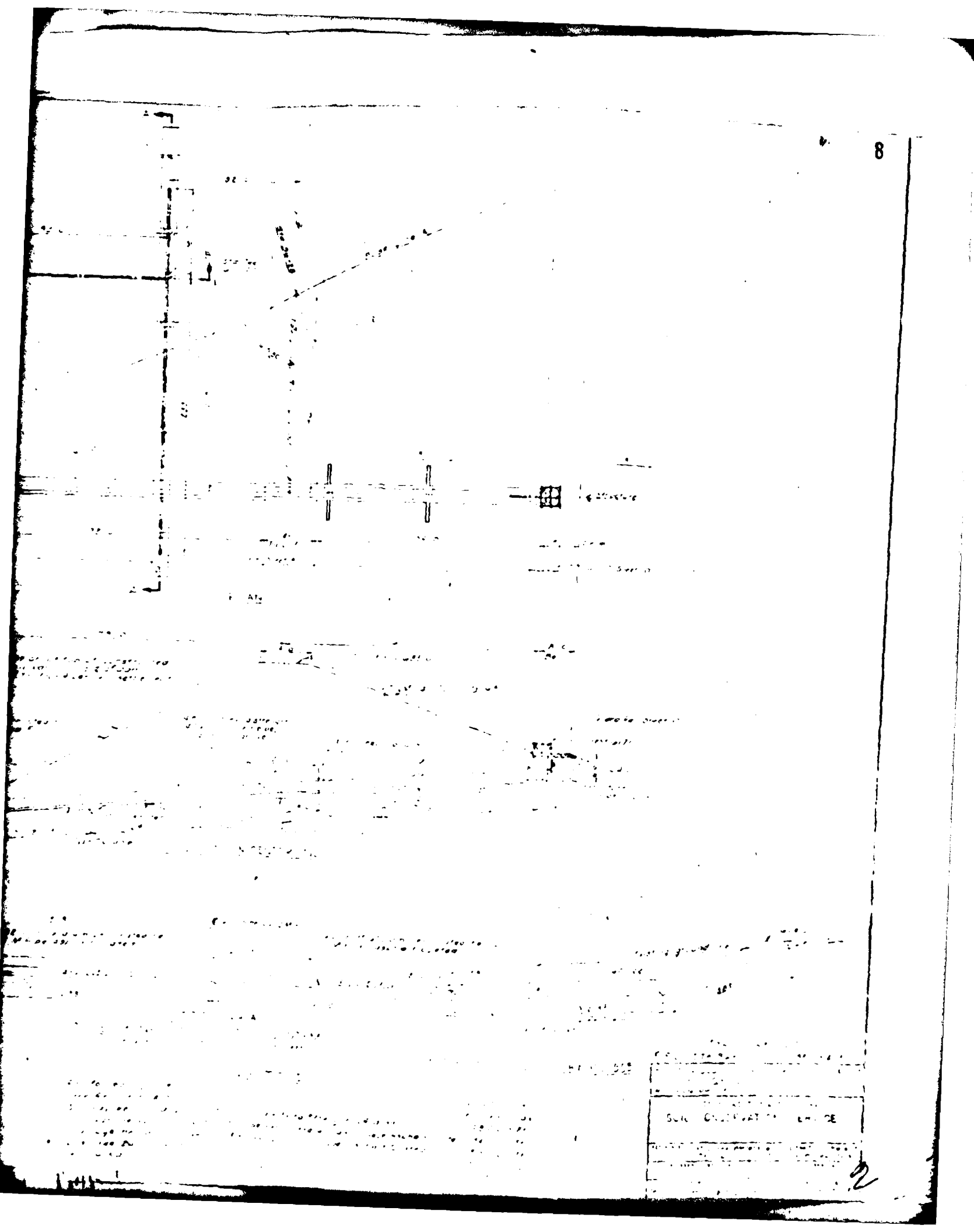
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FLOOD DETENT ON STRUCTURE No 1
Need Subsurface Explorations

U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

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PLAN
GENERAL - 2-5-57

1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

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ANTI SEEP COL. AG 222

STOCK WATERING SYSTEM DETAILS

THE SECRET

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See Spec. 100

CONCRETE
Anti-seep Concrete
No. 1000 Base - 2000 Cores

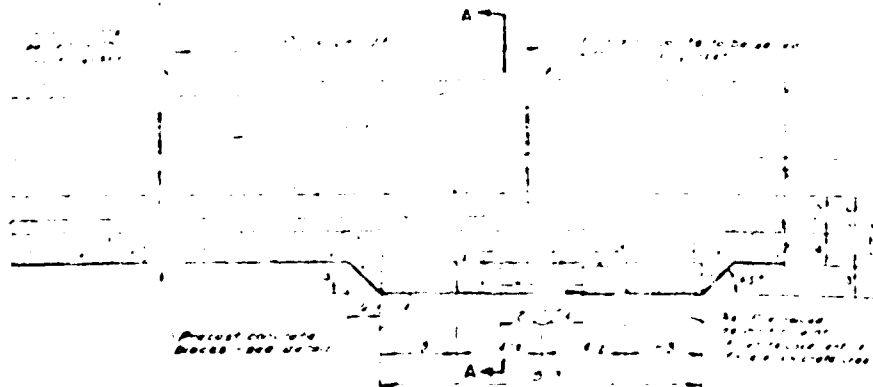
STOCK WATER SYSTEM DETAILS

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

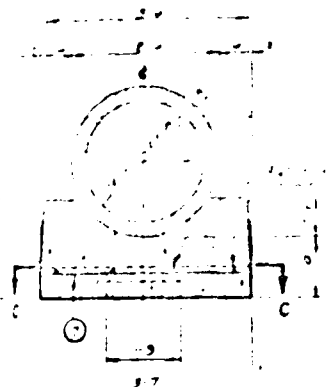
DATE: 10/10/68

BY: [Signature]

10/10/68

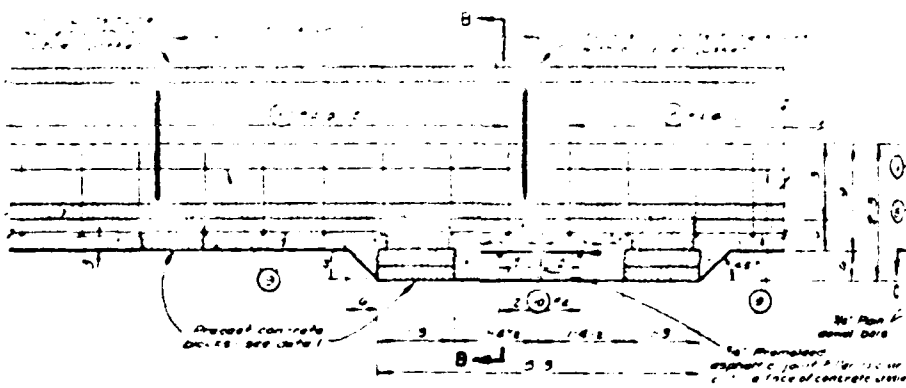


DETAILS OF EXPANSION JOINT AND TYPE II CRADLE

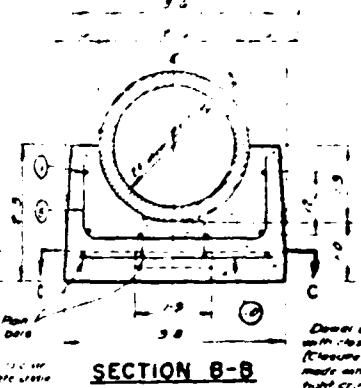


SECTION A-A

PREC



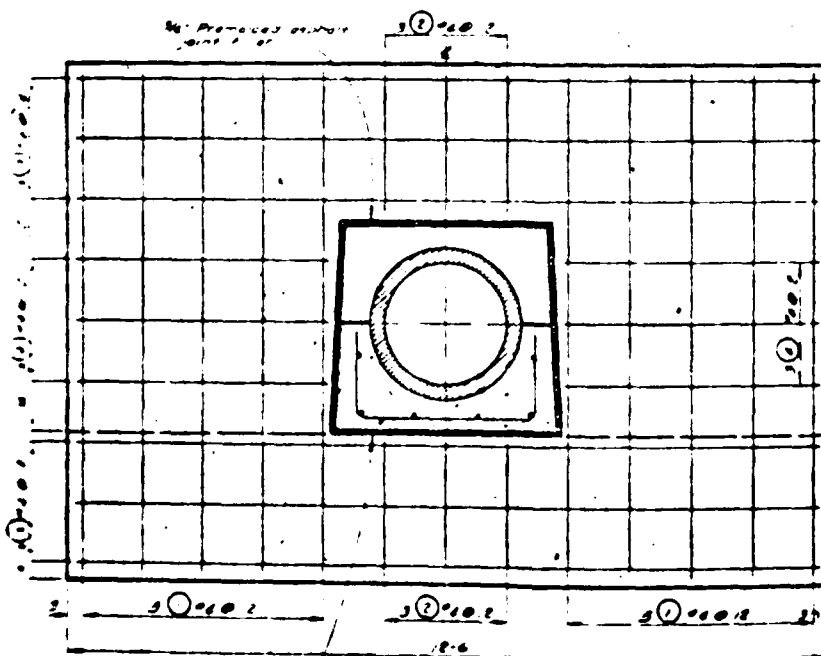
DETAILS OF EXPANSION JOINT AND TYPE III CRADLE



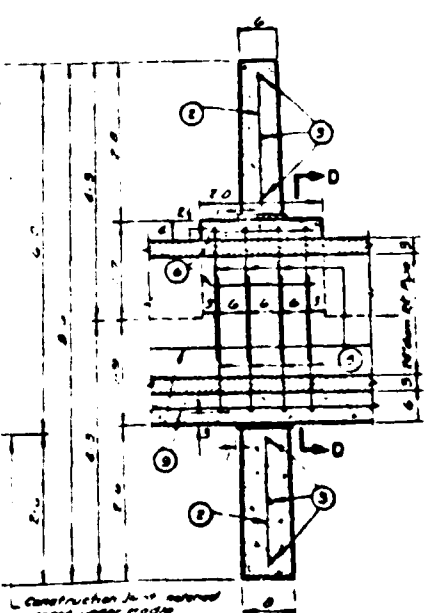
SECTION B-B

Drawn at 1/2" = 1'-0" (Check may be made with a scale of 1/2" = 1'-0" if necessary.)

Also provide reinforcement and detail of each end.

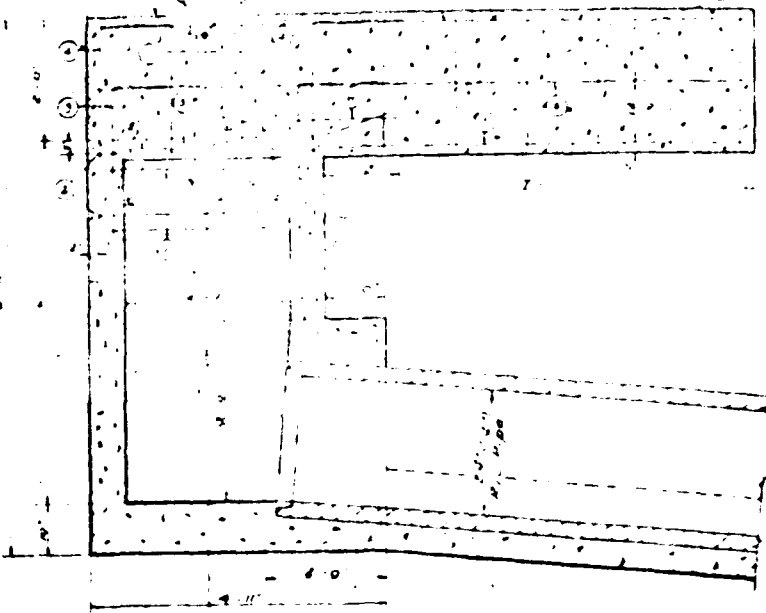


ELEVATION OF ANTI-SEEP COLLAR

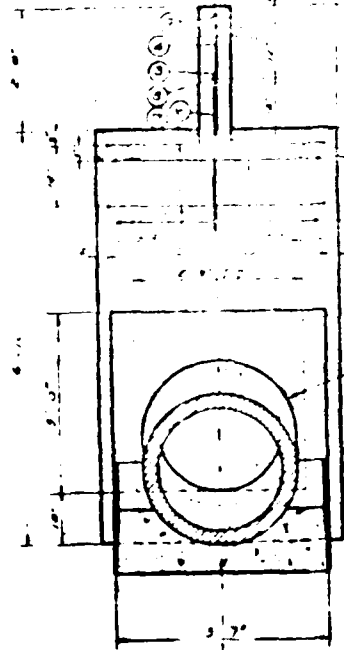


SECTION ON E

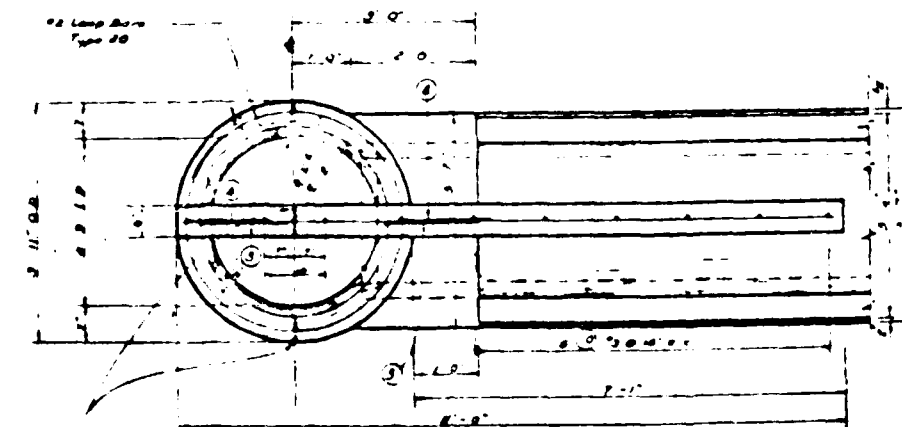
| | | | | |
|---|---------------|-----------------|-----------------|-----------------|
| (REINFORCED CONCRETE DROP INLET 24" DIA)
DETAILS OF TYPE 2, 3 CRADLE, ANTI-SEEP COLL | | | | |
| U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE | | | | |
| (OFFICE) | | | | |
| DISTRICT OFFICE | | | REGIONAL OFFICE | |
| DISTRICT
010 | OFFICE
010 | DISTRICT
010 | REGIONAL
010 | REGIONAL
010 |



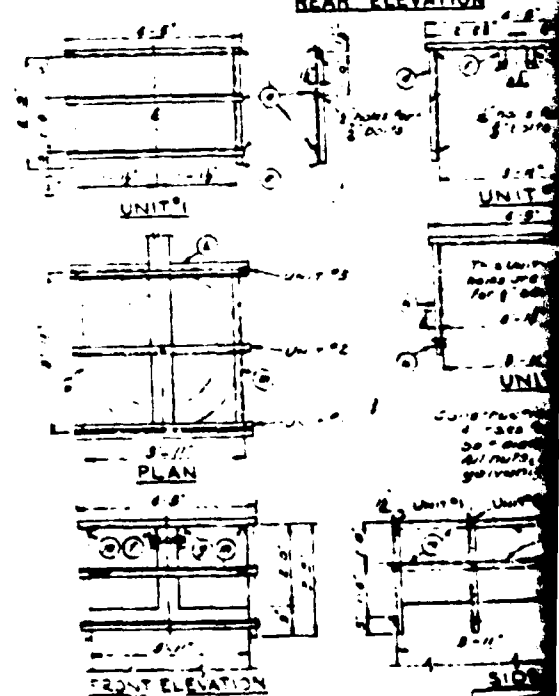
SECTION ON CENTERLINE



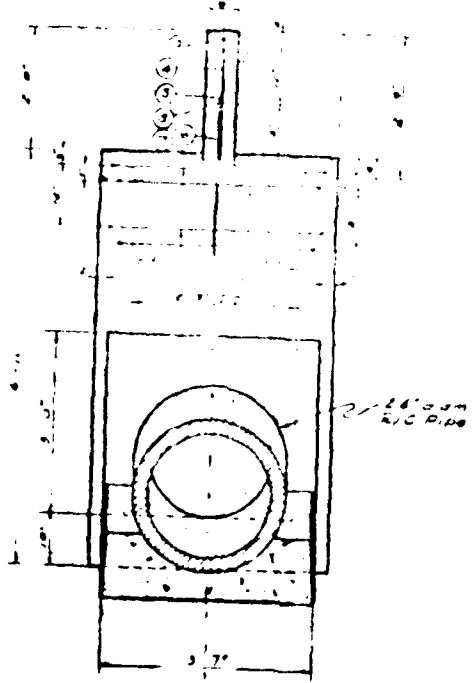
REAR ELEVATION



PLAN



| | | | |
|------|----------|------|----------|
| Item | Quantity | Unit | Material |
| 1 | 1 | ea | Steel |
| 2 | 1 | ea | Steel |
| 3 | 1 | ea | Steel |
| 4 | 1 | ea | Steel |
| 5 | 1 | ea | Steel |
| 6 | 1 | ea | Steel |
| 7 | 1 | ea | Steel |
| 8 | 1 | ea | Steel |
| 9 | 1 | ea | Steel |
| 10 | 1 | ea | Steel |
| 11 | 1 | ea | Steel |
| 12 | 1 | ea | Steel |
| 13 | 1 | ea | Steel |
| 14 | 1 | ea | Steel |
| 15 | 1 | ea | Steel |
| 16 | 1 | ea | Steel |
| 17 | 1 | ea | Steel |
| 18 | 1 | ea | Steel |
| 19 | 1 | ea | Steel |
| 20 | 1 | ea | Steel |



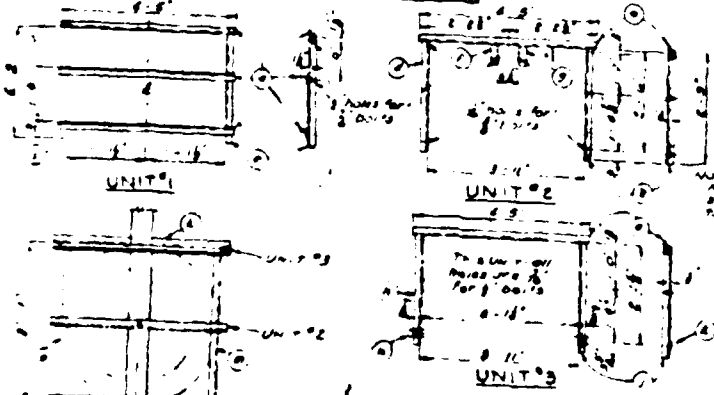
QUANTITIES

| | | | |
|-------|---|---------|----|
| STEEL | 2 | 45' 10" | 76 |
| | 3 | 16' | 6 |
| | 4 | 20' | 13 |
| | 5 | 31.75' | 13 |

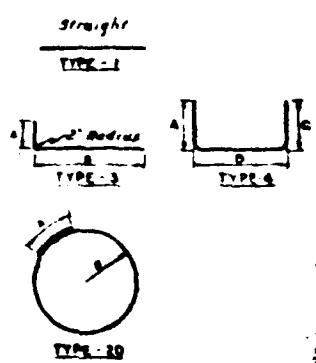
BILL OF MATERIAL FOR GUARD RAIL

| ITEM | DESCRIPTION | LENGTH |
|------|--------------------------------|--------|
| 1 | 1/2" x 1/2" x 1/2" Steel Angle | 4'-5" |
| 2 | 1/2" x 1/2" x 1/2" Steel Angle | 4'-5" |
| 3 | 1/2" x 1/2" x 1/2" Steel Angle | 4'-5" |
| 4 | 1/2" x 1/2" x 1/2" Steel Angle | 4'-5" |
| 5 | 1/2" x 1/2" x 1/2" Steel Angle | 4'-5" |
| 6 | 1/2" x 1/2" x 1/2" Steel Angle | 4'-5" |
| 7 | 1/2" x 1/2" x 1/2" Steel Angle | 4'-5" |
| 8 | 1/2" x 1/2" x 1/2" Steel Angle | 4'-5" |
| 9 | 1/2" x 1/2" x 1/2" Steel Angle | 4'-5" |
| 10 | 1/2" x 1/2" x 1/2" Steel Angle | 4'-5" |
| 11 | 1/2" x 1/2" x 1/2" Steel Angle | 4'-5" |
| 12 | 1/2" x 1/2" x 1/2" Steel Angle | 4'-5" |
| 13 | 1/2" x 1/2" x 1/2" Steel Angle | 4'-5" |
| 14 | 1/2" x 1/2" x 1/2" Steel Angle | 4'-5" |
| 15 | 1/2" x 1/2" x 1/2" Steel Angle | 4'-5" |
| 16 | 1/2" x 1/2" x 1/2" Steel Angle | 4'-5" |
| 17 | 1/2" x 1/2" x 1/2" Steel Angle | 4'-5" |
| 18 | 1/2" x 1/2" x 1/2" Steel Angle | 4'-5" |
| 19 | 1/2" x 1/2" x 1/2" Steel Angle | 4'-5" |
| 20 | 1/2" x 1/2" x 1/2" Steel Angle | 4'-5" |

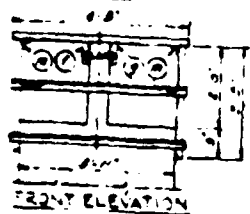
REAR ELEVATION



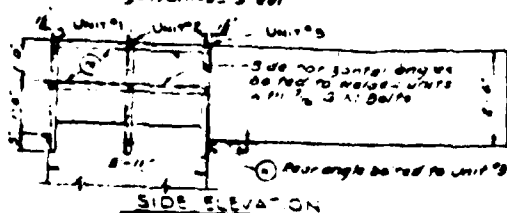
BAR TYPE DETAILS



PLAN



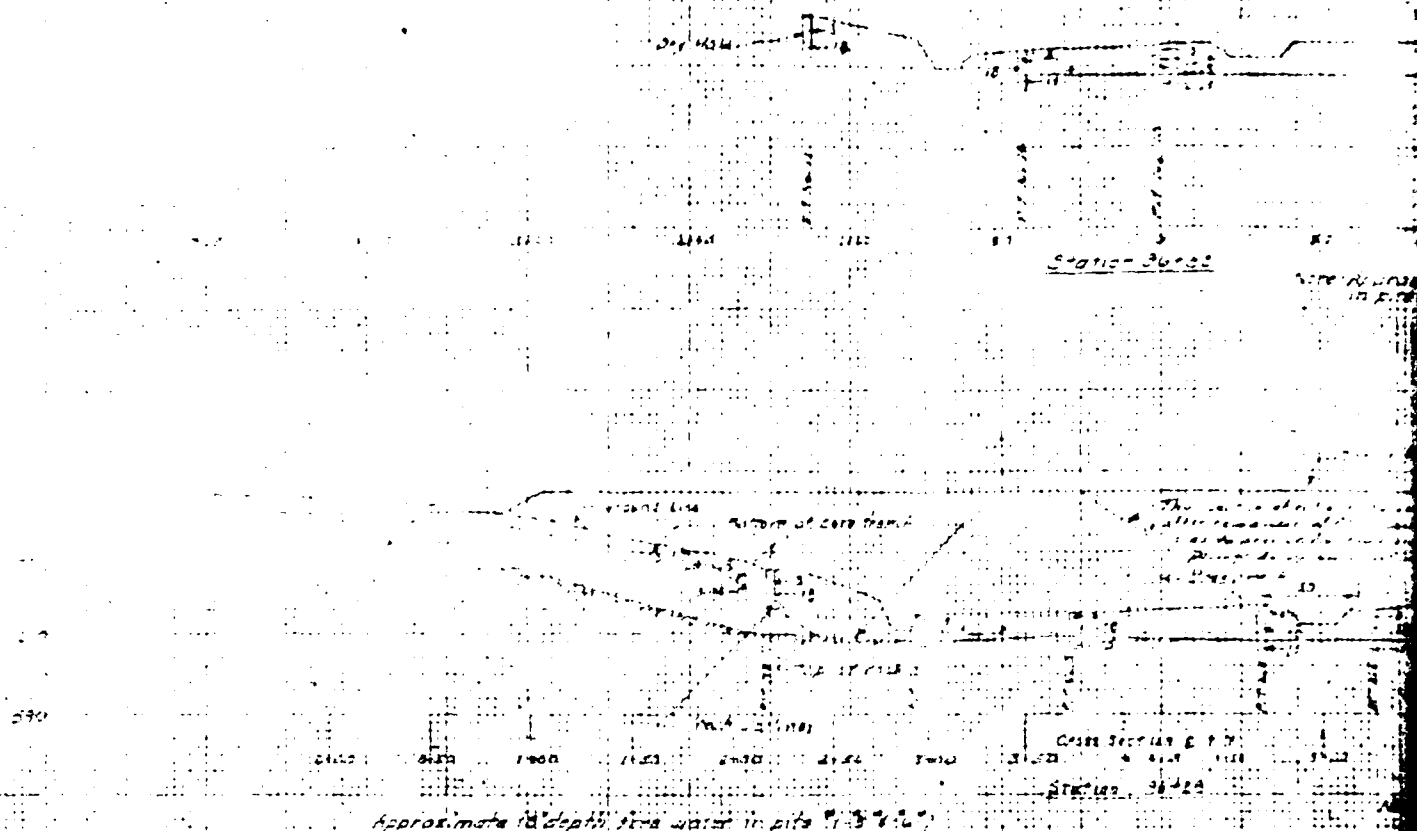
SIDE ELEVATION



Construction Note
Metal forms are available at the St. Charles County Jail District Office located at St. Charles, Missouri, and can be rented for a nominal fee.

MODIFICATION NO. 1 28 APRIL 1955

| | |
|--|---------------------------|
| CONCRETE CIRCULAR RISER
FOR 24" DIA. R/C PIPE | |
| U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE | |
| ATTENTION: East Creek Watershed Branch in Project | at St. Charles, Mo. 64501 |
| Estimated: 1/2/55 | Technical: 1/2/55 |
| Prepared: 1/2/55 | Checked: 1/2/55 |
| Date: 1/2/55 | Drawn: 1/2/55 |

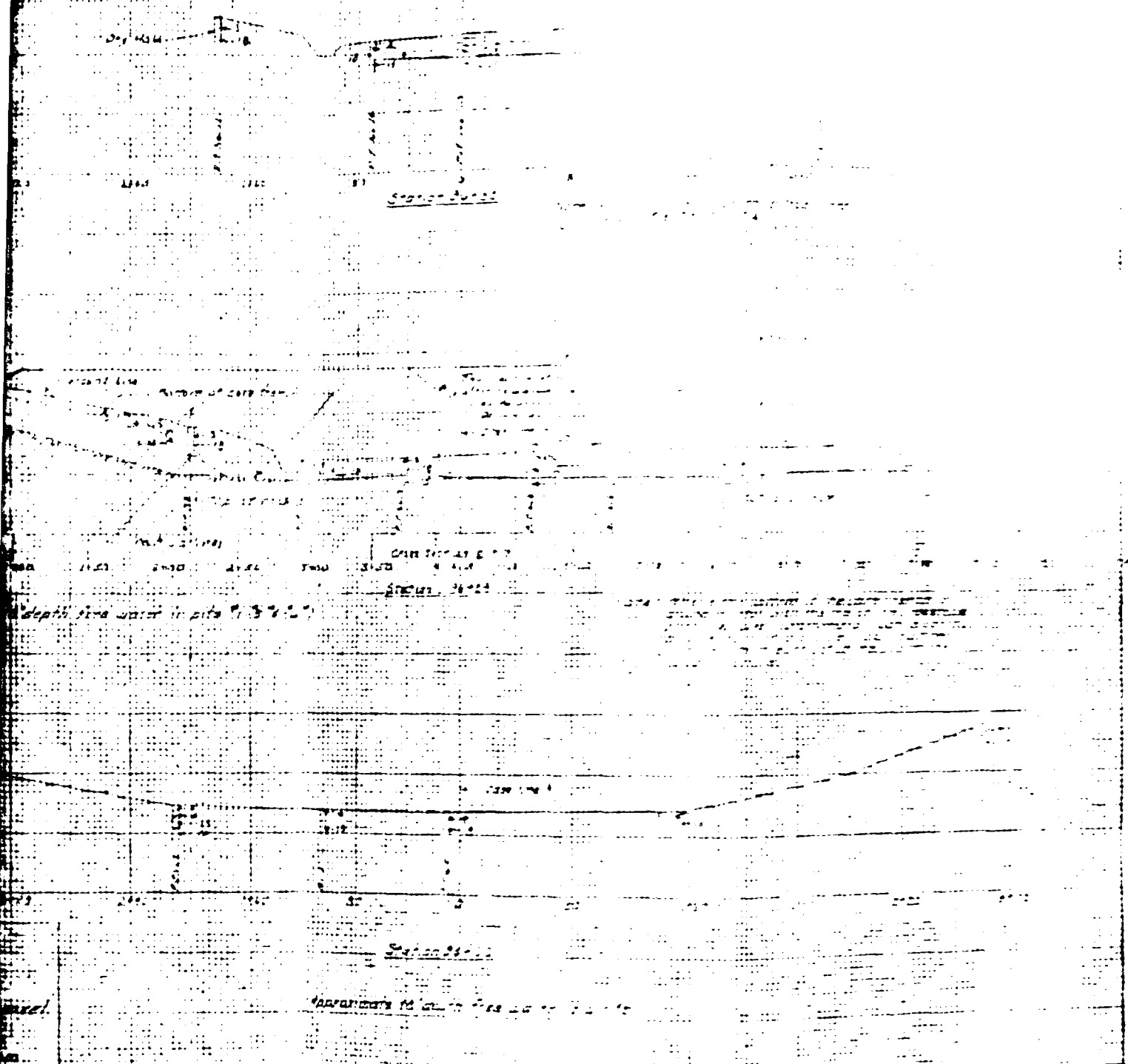


Geological Legend

1. Sandstone
2. Shale
3. Gravel
4. Limestone
5. Clay shale from street exposure to contact with limestone with 1 to 2 ft. of clay

Station 36+00

Approximate to depth 100 feet water in pits



| | |
|---------------------------------|--|
| U.S. DEPARTMENT OF AGRICULTURE | |
| SOIL CONSERVATION SERVICE | |
| OFFICE OF THE DISTRICT ENGINEER | |
| NATIONAL SYSTEM OF PUBLIC LANDS | |
| BUREAU OF LAND MANAGEMENT | |
| WASHINGTON, D.C. | |

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84.40

57.50

44.40

44.40

74.13

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74.13

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600

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74.13

84.40

57.50

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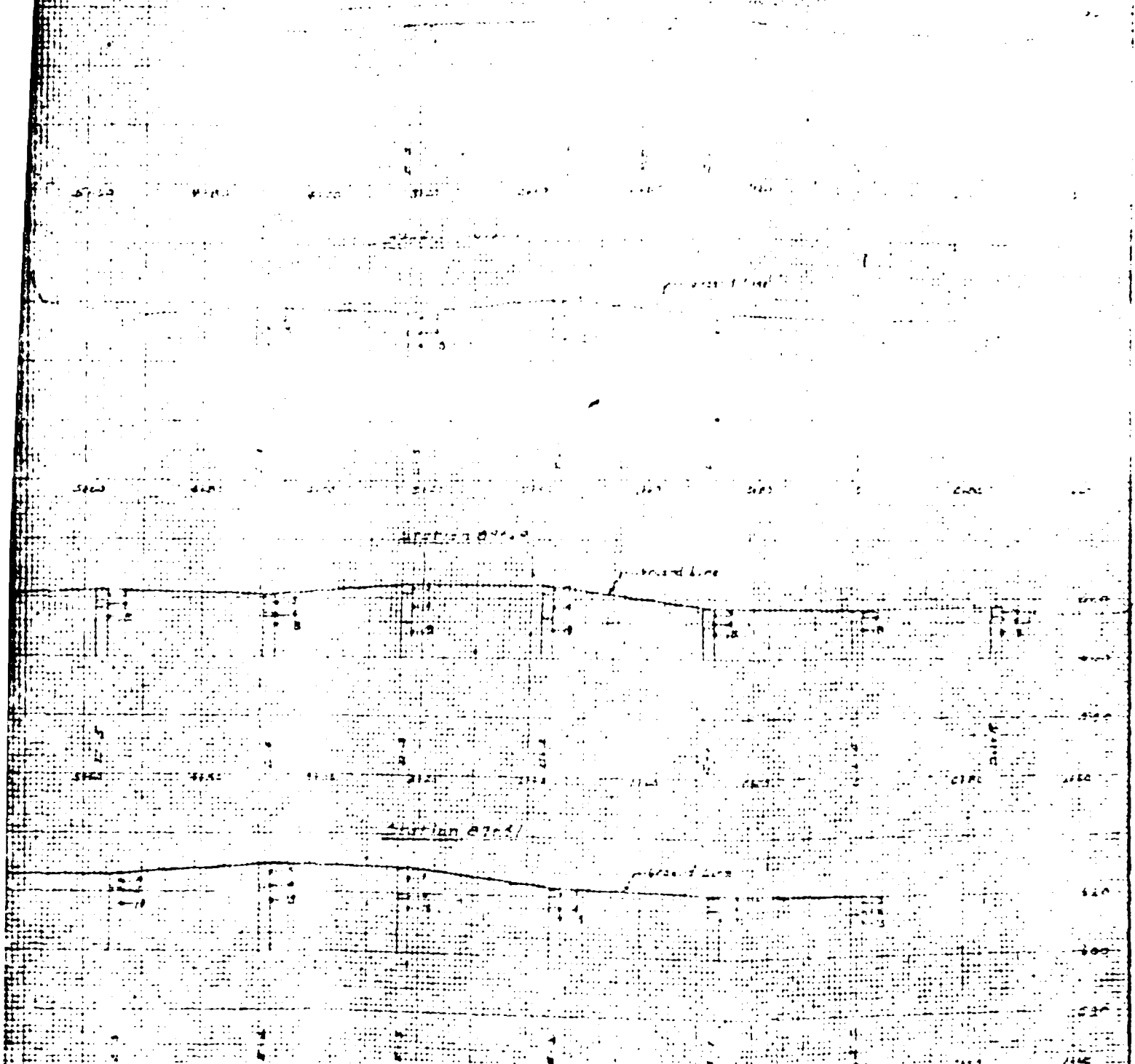
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Section 87-10

Section 87-11

Section 87-12



STATIONARY
STA 95-39 to STA 9-91 GULLY A
- see map sheet 1 Map 1

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

WATERWAY COST CODE - WATERWAYS - 25 points per
100 ft. of waterway - 100 ft. of waterway - 100 ft. of waterway

| WATERWAY | WATERWAY | WATERWAY | WATERWAY | WATERWAY |
|----------|----------|----------|----------|----------|
| WATERWAY | WATERWAY | WATERWAY | WATERWAY | WATERWAY |

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Area covered by snow in 1958

Area covered by snow in 1959

Area covered by snow in 1960

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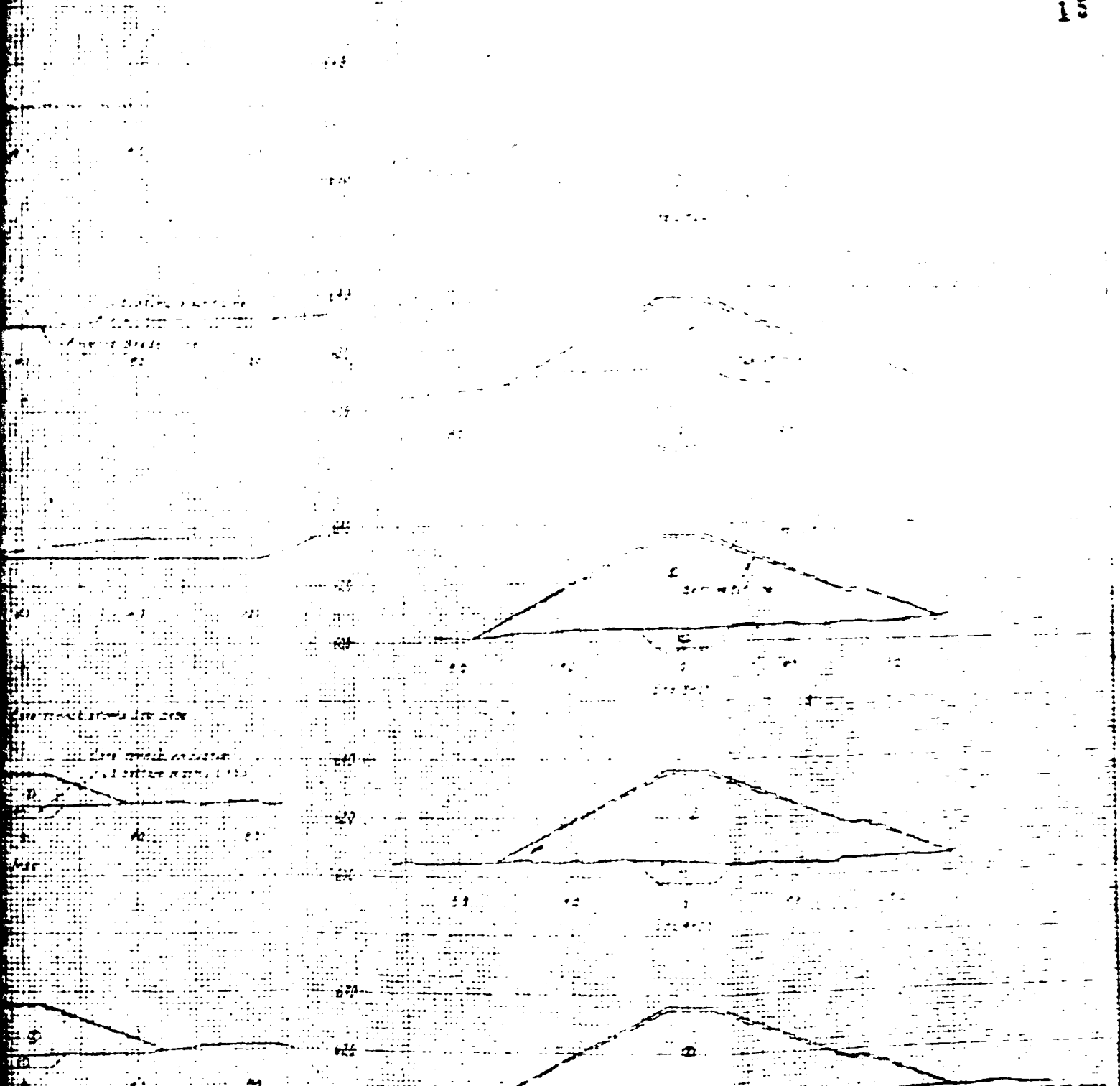
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| | | | |
|------------------------------------|---------|---------|-------|
| STATIONING | | | |
| STATIONING IN STA. 4-10 ON E. SIDE | | | |
| U.S. DEPARTMENT OF AGRICULTURE | | | |
| SOIL CONSERVATION SERVICE | | | |
| OFFICE OF THE DISTRICT ENGINEER | | | |
| DISTRICT OFFICE | | | |
| Project | Station | Section | Sheet |
| 4-10 | 4-11 | 4-12 | 4-13 |
| 4-10 | 4-11 | 4-12 | 4-13 |

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600

640

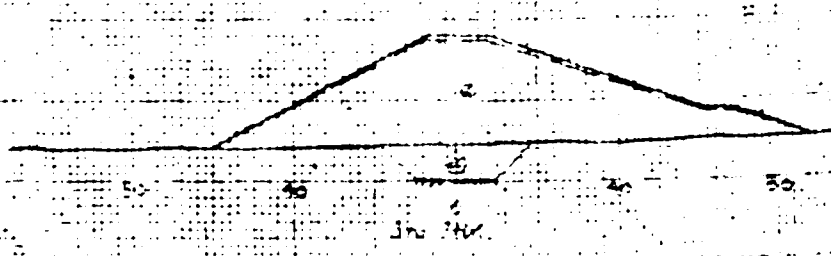
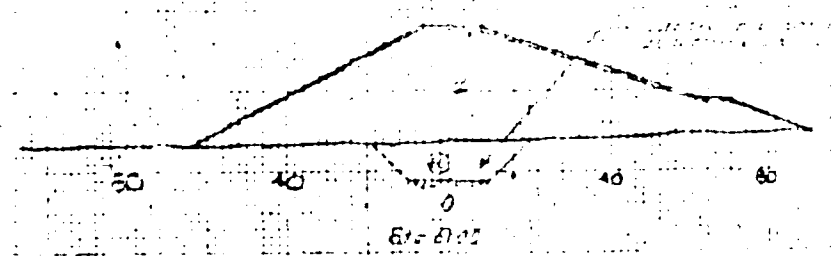
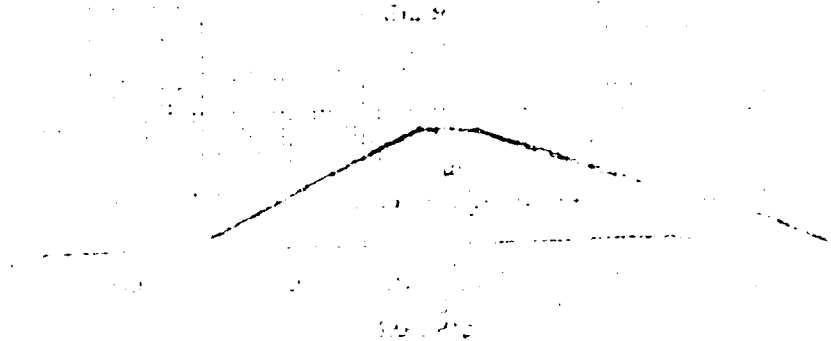
620

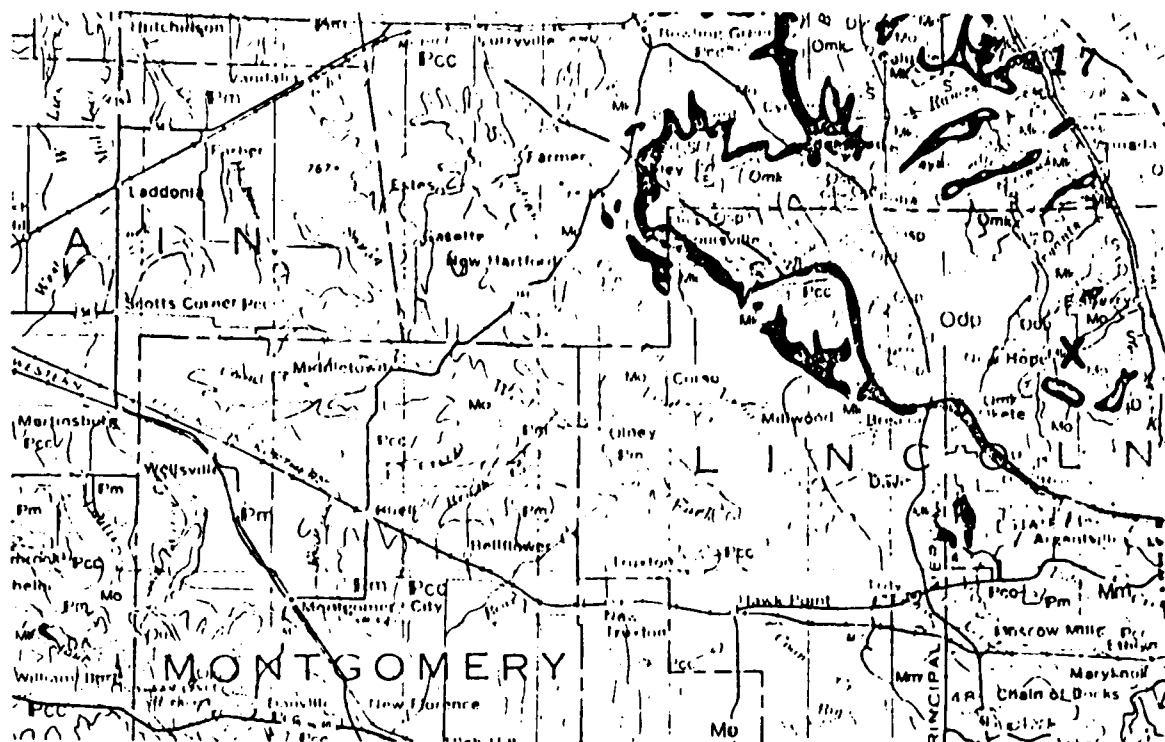
600

80

80

80





QUATERNARY — Qal - ALLUVIAN

SILURIAN — S - SILURIAN UNDIVIDED

PENNSYLVANIAN — Pcc - CHEROKEE GROUP

MISSISSIPPIAN {
Mm - MERAMECIAN SERIES
Mo - OSAGEAN SERIES
Mk - KINDERHOOKIAN SERIES,
CHOTEAU GROUP

ORDOVICIAN

Omk {
NOIX LIMESTONE
MAQUOKETA SHALE
CAPE LIMESTONE
KIMMSWICK FORMATION
Odp {
DECORAH FORMATION
PLATTIN FORMATION
Osp - ST. PETER'S
SANDSTONE

DEVONIAN — DEVONIAN UNDIVIDED

X - LOCATION OF DAM , MO. 10212

REFERENCE :
GEOLOGIC MAP OF MISSOURI ,
MISSOURI GEOLOGIC SURVEY ,
a) 1961 , b) 1979

GEOLOGIC MAP
OF
LINCOLN COUNTY
AND
ADJACENT AREA



APPENDIX A

PHOTOGRAPHS TAKEN DURING INSPECTION

OVERVIEW

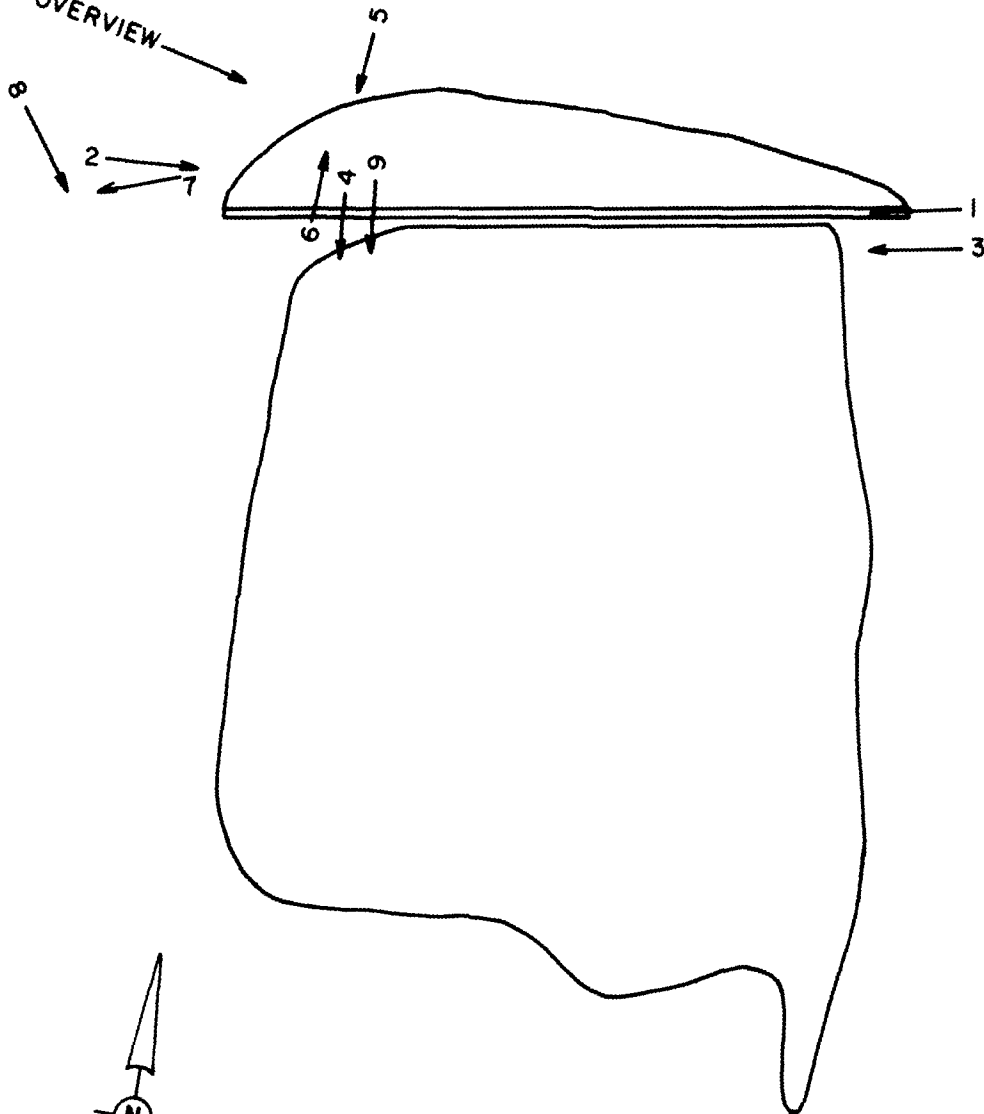


PHOTO INDEX
FOR
LOST LAKE DAM

Lost Lake Dam

- Photo 1. - View of the crest of the embankment.
- Photo 2. - View of the downstream embankment slope.
- Photo 3. - View of the upstream embankment slope.
- Photo 4. - View of the intake to drop inlet structure.
- Photo 5. - View of the outlet of the 24-inch diameter concrete conduit.
- Photo 6. - View of the discharge channel of the 24-inch diameter concrete conduit.
- Photo 7. - View of the emergency spillway on the left abutment.
- Photo 8. - View of the emergency spillway on the left abutment.
- Photo 9. - View of the reservoir rim.

Lost Lake Dam

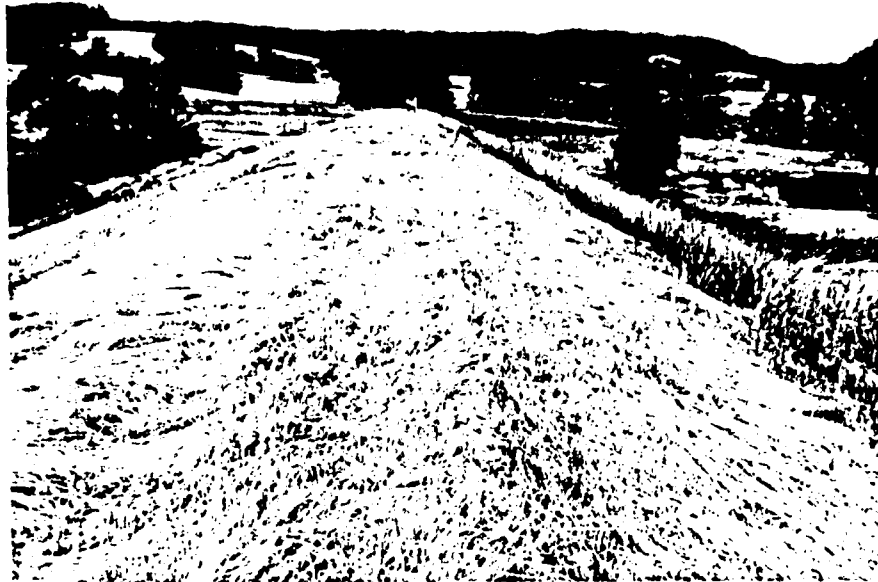


Photo 1



Photo 2

Lost Lake Dam



Photo 3



Photo 4

Lost Lake Dam



Photo 5



Photo 6

Lost Lake Dam



Photo 7



Photo 8

Lost Lake Dam

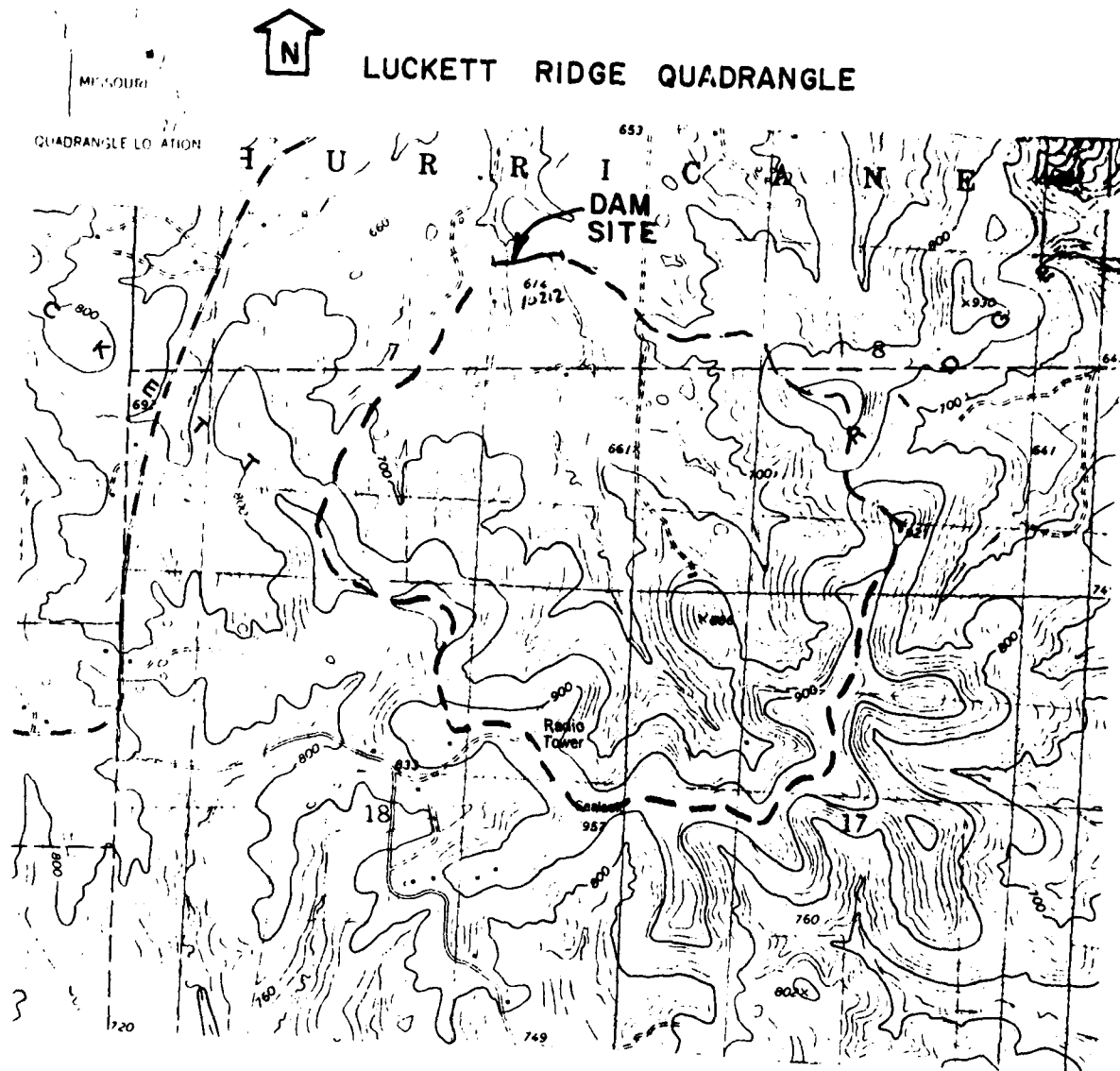


Photo 9

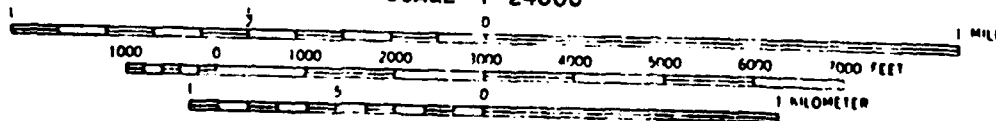
APPENDIX B

HYDROLOGIC COMPUTATIONS

PLATE 1, APPENDIX B



SCALE 1 24000



CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

DRAINAGE BOUNDARY - - - - -

LOST LAKE DAM (MO 10212)
DRAINAGE BASIN

DAM SAFETY INSPECTION ~ UTAH

SHEET NO. 1 OF

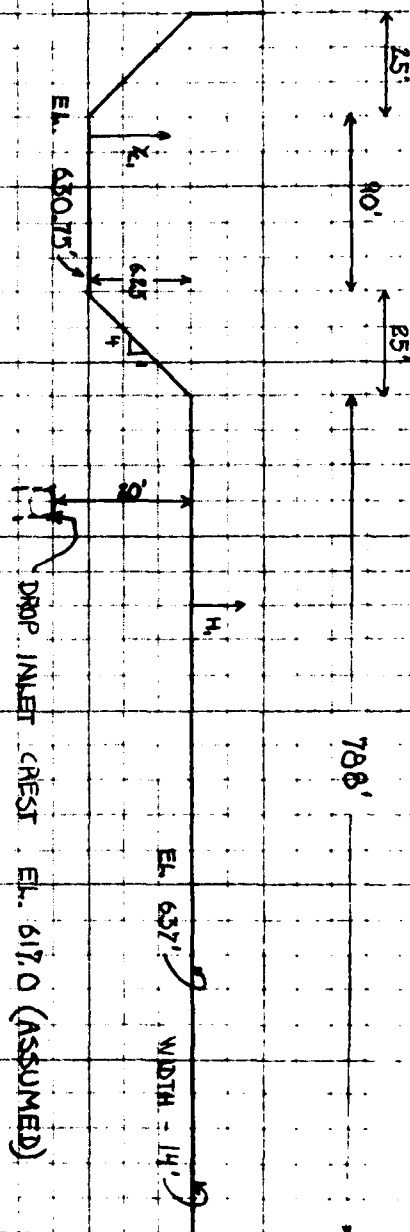
LOST LAKE DAM # 10212

JOB NO. 1240

SPILLWAY AND OVERTOP RATING CURVE

BY DNZ DATE 6/21/79
418 6-26-79

| Y_c | A_c | T_c | $K = 50 \sqrt{A}$ | $K^2/2g$ | $Q_c = A_c Y_c$ | $U/S \text{ W.S.}$
$Y_c + K^2/2g + 650.75$ | C_1 | L_1 | H_1 | $Q = C_1 L_1 H_1^{3/2}$ | $Q_T = Q_c + Q_1$ |
|-------|-------|-------|-------------------|----------|-----------------|---|-------|-------|-------|-------------------------|-------------------|
| 0 | 0 | 0 | 0 | 0 | 0 | 650.75 | - | - | - | - | 0 |
| 1 | 94 | 98 | 5.6 | 0.5 | 522.0 | 652.25 | - | - | - | - | 622.25 |
| 2 | 196 | 106 | 7.71 | 0.92 | 1511.2 | 653.7 | - | - | - | - | 1511.2 |
| 3 | 306 | 114 | 9.3 | 1.3 | 2842.6 | 655.1 | - | - | - | - | 2842.6 |
| 4 | 424 | 122 | 10.6 | 1.7 | 4481.8 | 656.5 | - | - | - | - | 4481.8 |
| 4.25 | 454.6 | 123.9 | 10.9 | 1.8 | 4937.2 | 656.8 | - | - | - | - | 4937.2 |
| 5 | 550 | 130 | 11.7 | 2.1 | 6414.4 | 657.9 | 2.64 | 708 | .9 | 1776.2 | 8191 |
| 6.25 | 718.8 | 140 | 12.8 | 2.6 | 9234.6 | 659.6 | 2.53 | 700 | 2.6 | 8688.4 | 17923 |
| 5.5 | 616 | 134 | 12.2 | 2.3 | 7480.6 | 658.6 | 2.63 | 700 | 1.6 | 4194.3 | 11683 |



DAM SAFETY INSPECTION - MISSOURI

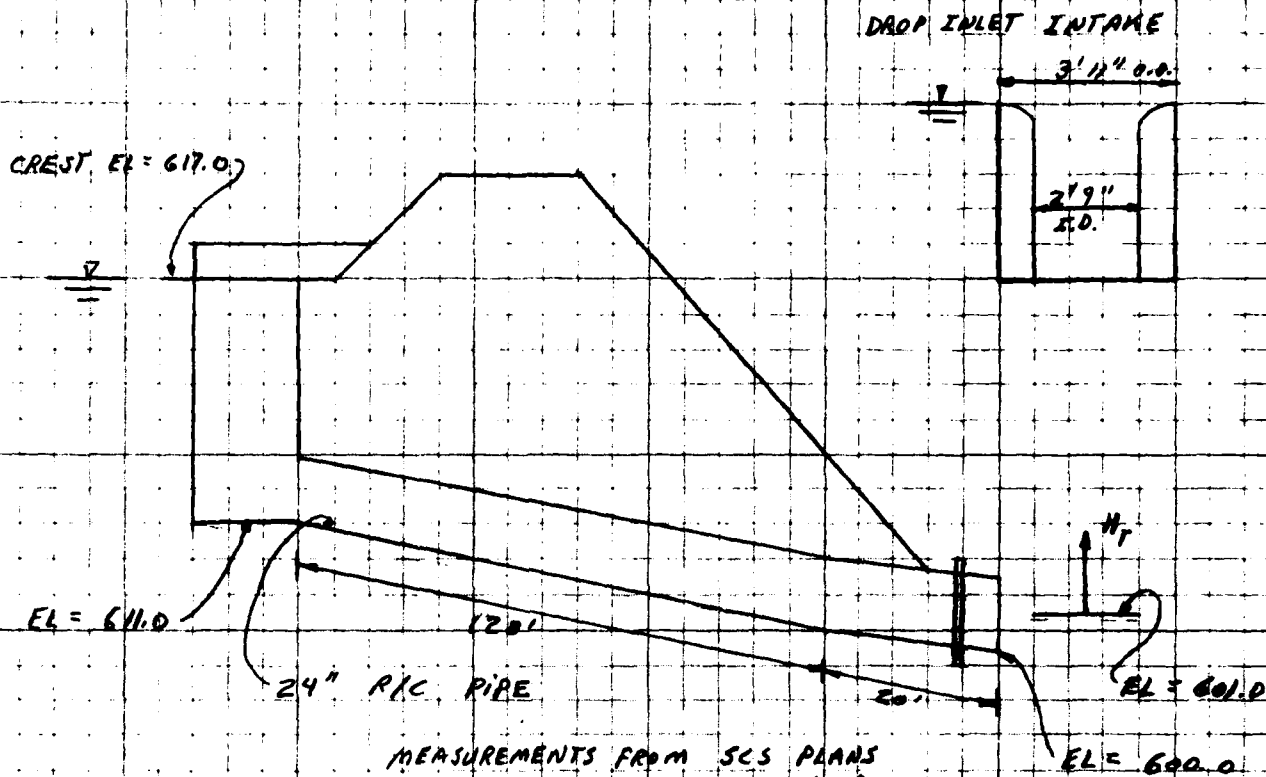
SHEET NO. 2 OF

LOST LAKE DAM (10212)

JOB NO. 1240-001

PRINCIPAL SPILOWAY RATING CURVE

BY H&B DATE 6-21-68



DAM SAFETY INSPECTION - MISSOURI

SHEET NO. 3 OF

LOST LAKE DAM (10212)

JOB NO. 1240-001

PRINCIPAL SPIWAY DISCHARGE

BY HLB DATE 6-21-79

$$H_T = \left(1 + 0.5 + 0.025 \frac{148}{2}\right) \frac{V^2}{2g}$$

$$H_T = 3.35 \frac{V^2}{2g} \Rightarrow V = 4.38 \sqrt{H_T}$$

$$Q = A \cdot V = \pi \frac{D^2}{4} \times 4.38 \sqrt{H_T} = \pi \frac{9}{4} \times 4.38 \sqrt{H_T}$$

$$Q = 13.77 \sqrt{H_T}$$

$$H_T = 617.5 - 601.0 = 16.5$$

$$Q = 13.77 \sqrt{16.5} = 56 \text{ CFS.}$$

∴ AT ELEV. 617.5 WEIR FLOW CONTROLS

AND $Q = 13 \text{ CFS.}$

$$\text{AT W.L.} = 618.0 \quad H = 618.0 - 601.0 = 1.0$$

a) WEIR FLOW,

$$Q = CLH^{3/2} = 3.03 \times 12.83 \times 1^{3/2} = 37 \text{ CFS.}$$

b) PRESSURE FLOW

$$Q = 13.77 \sqrt{H_T}, \quad H_T = 618 - 601 = 17.$$

$$Q = 13.77 \sqrt{17} = 57 \text{ CFS.}$$

∴ AT ELEV. 618, WEIR FLOW CONTROLS

AND $Q = 37 \text{ CFS.}$

DAM SAFETY INSPECTION - MISSOURI

SHEET NO. 4 OF

LOST LAKE DAM (10212)

JOB NO. 1240-001

PRINCIPAL SPILLWAY DISCHARGE

BY KLB DATE 6-21-79

$$\text{AT. W.L.} = 619, H = 619 - 617 = 2$$

a) WEIR FLOW

$$Q = CLH^{3/2} = 3.03 \times 12.33 \times 2^{3/2} = 106 \text{ CFS}$$

b) PRESSURE FLOW, $H_f = 619 - 601 = 18$

$$Q = 13.77 \sqrt{H_f} = 13.77 \sqrt{18} = 58 \text{ CFS}$$

 \therefore AT W.L. = 619 PRESSURE FLOW CONTROLSAND $Q = 58 \text{ CFS}$.

ALSO FOR ALL ELEVATIONS ABOVE 619
PRESSURE FLOW WILL CONTROL
AND THE EQUATION

$$Q = 13.77 \sqrt{H_f} \text{ WILL BE USED}$$

DAM SAFETY INSPECTION - MISSOURI

SHEET NO. 5 OF

LOST LAKE DAM (10212)

JOB NO. 1240-001-

SPILLWAY AND OVERTOP RATING CURVE

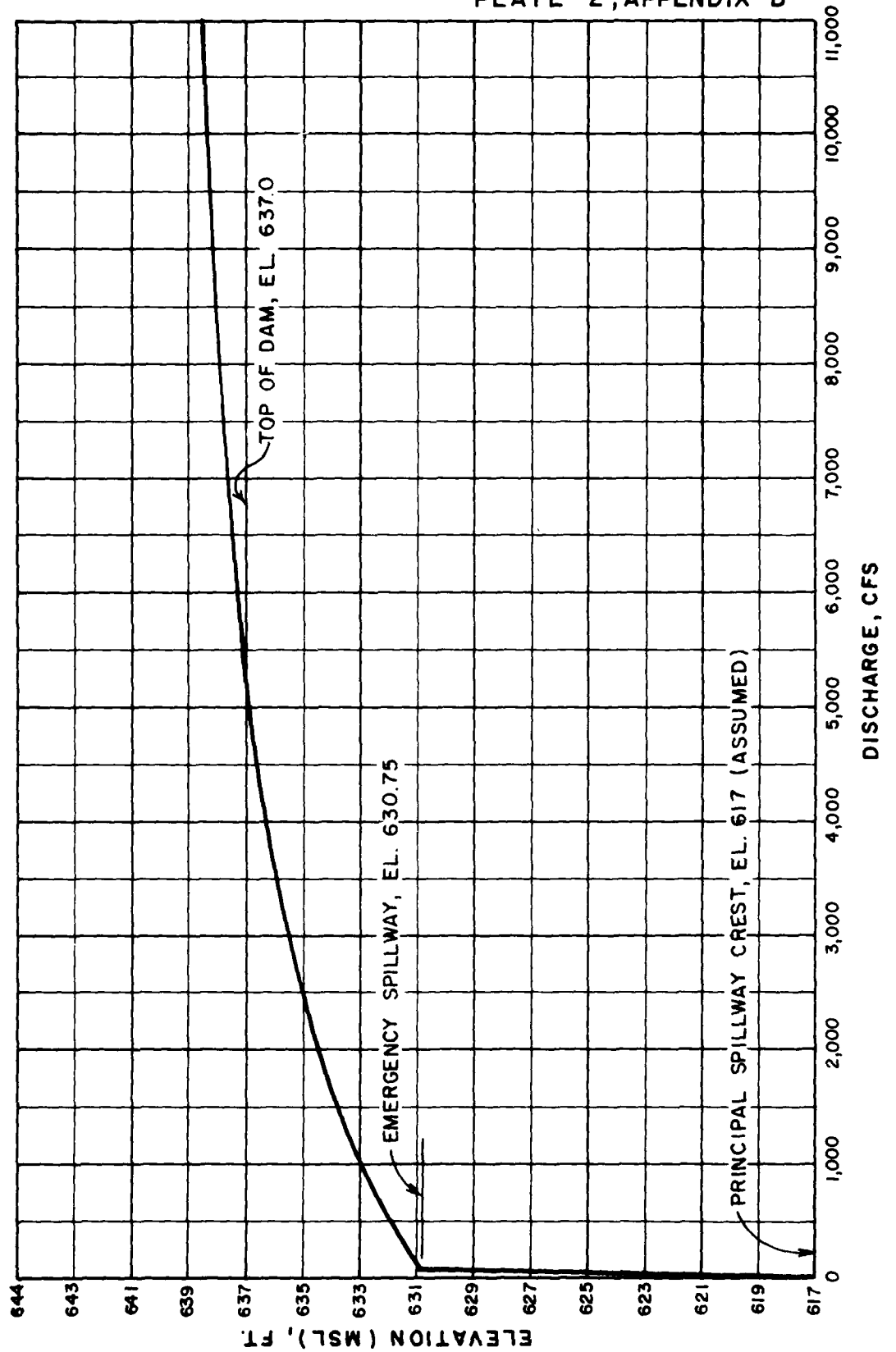
BY HLB DATE 6-31-79

COMBINED RATING CURVE TABULATION

| RESERVOIR
WATER
SURFACE
ELEV. | H _F | PRINCIPAL
SPILLWAY
DISCHARGE
$Q = 13.27 H^{3/2}$ | EMERGENCY
SPILLWAY
DISCHARGE | DISCHARGE
OVER TOP
OF DAM | COMBINED
DISCHARGE |
|--|----------------|---|------------------------------------|---------------------------------|-----------------------|
| 617.0 | 16.0 | - | - | - | 0 |
| 617.5 | 16.5 | 13* | - | - | 13 |
| 618.0 | 17.0 | 37* | - | - | 37 |
| 619.0 | 18.0 | 58 | - | - | 58 |
| 623.0 | 22.0 | 65 | - | - | 65 |
| 628.0 | 27 | 72 | - | - | 72 |
| 630.75 | 29.75 | 75 | - | - | 75 |
| 632.25 | 31.25 | 77 | 522 | - | 599 |
| 633.7 | 32.7 | 79 | 1511 | - | 1590 |
| 635.1 | 34.1 | 80 | 2,843 | - | 2,923 |
| 636.5 | 35.5 | 82 | 4,484 | - | 4,564 |
| 636.8 | 35.8 | 82 | 4,937 | - | 5,019 |
| 637.9 | 36.9 | 84 | 6,414 | 1,776 | 8,274 |
| 638.6 | 37.6 | 84 | 7,489 | 4,194 | 11,767 |

* WEIR FLOW CONTROLS.

PLATE 2, APPENDIX B



LOST LAKE DAM (MO. 10212)
SPILLWAY & OVERTOP RATING CURVE

Dam Safety Inspection - Missouri

SHEET NO. 1 OF

LOST LAKE Dam - #10912

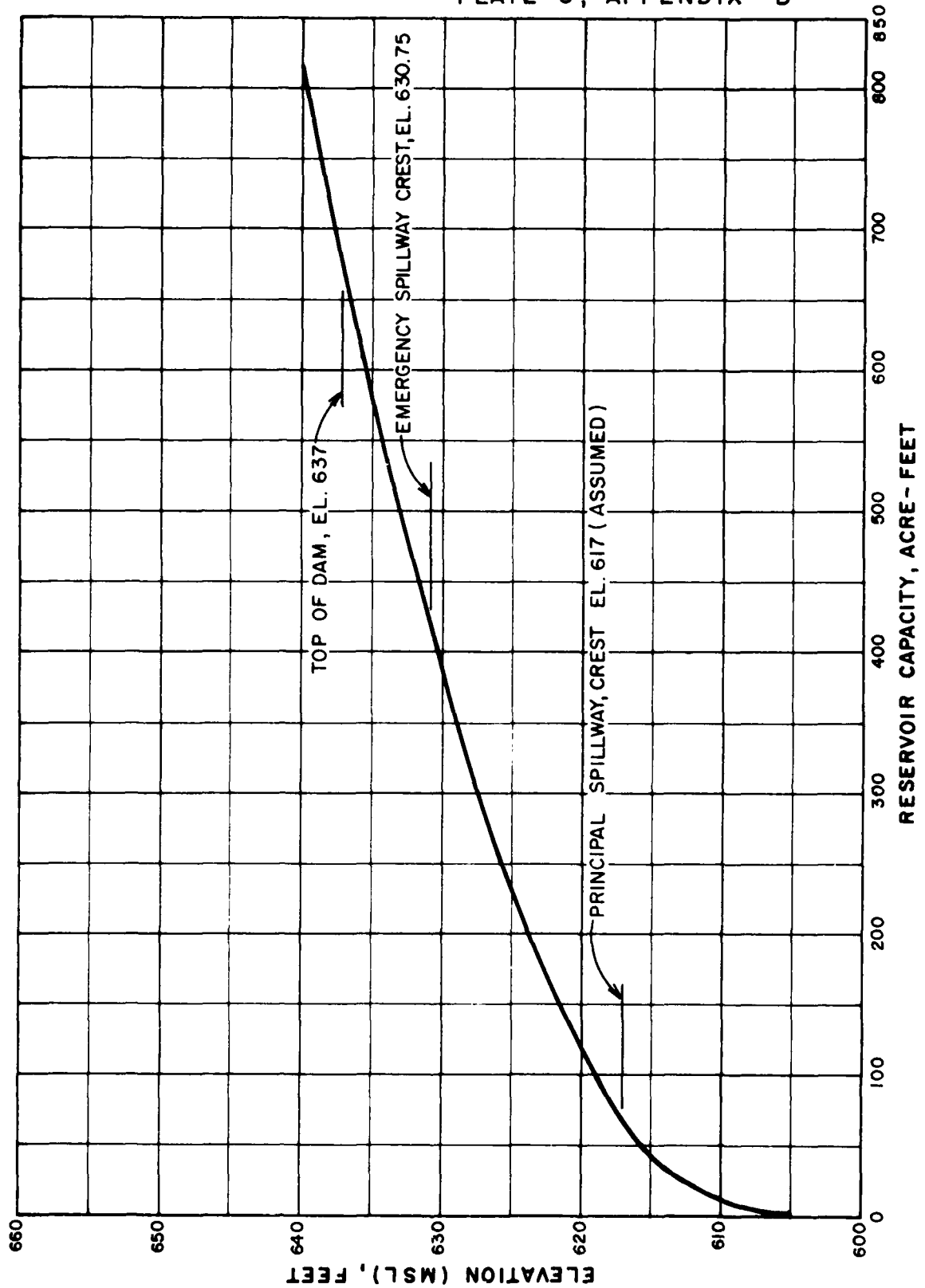
JOB NO. 1246

Reservoir Area Capacity

BY M.R.H. DATE 5-30-
D.N.E.V.LOST LAKE DAMReservoir Area Capacity

| Elev.
M.S.L.
(Ft.) | Reservoir
Surface
Area
(Acres) | Incremental
Volume
(Ac.-Ft.) | Total
Volume
(Ac.-Ft.) | Remarks |
|--------------------------|---|------------------------------------|------------------------------|---|
| 605 | 0 | 0 | 0 | Est. Streambed at
Dam |
| 614 | 11 | 33.0 | 33. | W.S. as shown on
Quadrangle. |
| 617 | 15 | 38.8 | 72 | PRINCIPAL SPIWAY CREST
EL. AS SHOWN ON PLANS |
| 620 | 19 | 50.9 | 123 | AREA MEASURED ON
USGS MAP |
| 630.75 | 36 | 290.8 | 414 | EMERGENCY SPIWAY CREST |
| 637 | 46 | 255.6 | 669.1 | TOP OF DAM |
| 640 | 51 | 145.4 | 815 | AREA MEASURED ON
USGS MAP. |

PLATE-3, APPENDIX - B



LOST LAKE DAM (MO. 10212)
RESERVOIR CAPACITY CURVE

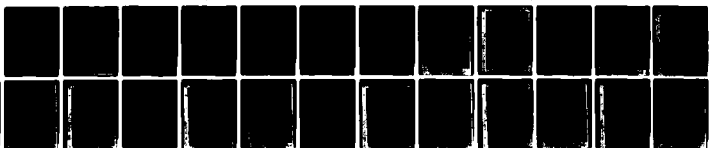
AO-A104 620

CONSOER TOWNSEND AND ASSOCIATES LTD ST LOUIS MO F/8 13/13
NATIONAL DAM SAFETY PROGRAM. LOST LAKE DAM (M010212), MISSISSIP--ETC(U)
SEP 79 W 6 SHIPRIN DACW43-79-C-0075

NL

UNCLASSIFIED

2 of 2
A
DOHCO



END

DATE

FILMED

40-811

DTIC

DAM SAFETY INSPECTION - MISSOURI

SHEET NO. 1 OF

LOST LAKE DAM # MO 10212

JOB NO. 1240

PROBABLE MAXIMUM PRECIPITATION

BY DNZ

DATE 6/9/79

KLB

6/23/79

LOST LAKE DAM # MO 10212

DETERMINATION OF PMP

1. DETERMINE DRAINAGE AREA OF BASIN

D. A. = 676 ACRES

2. DETERMINE PMP INDEX RAINFALL (200 SQ. MI + 24 HRS DUR.)

LOCATION OF CENTROID BASIN

LONG. = 90°48'41" LAT. = 39°06'30"

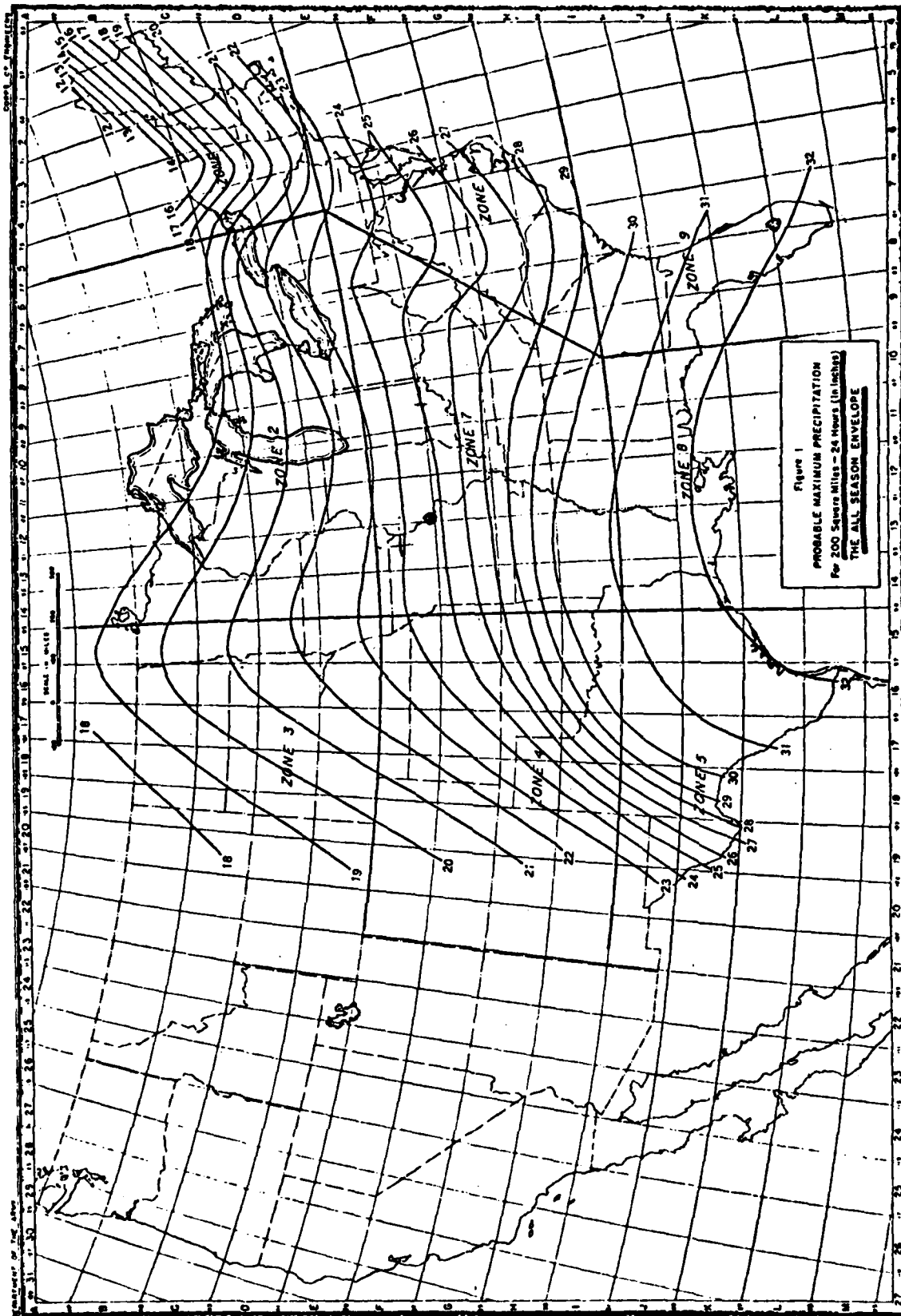
⇒ PMP = 24.7" (From Fig. 1, HMR #33)

3. DETERMINE BASIN RAINFALL IN TERMS OF PERCENTAGE OF PMP INDEX RAINFALL FOR VARIOUS DURATIONS:

LOCATION LONG. = 90°48'41" LAT. = 39°06'30"

⇒ ZONE 7

| DURATION (HOURS) | PERCENT OF INDEX RAINFALL | TOTAL RAINFALL (IN.) | RAINFALL INCREMENTS (IN.) | DURATION OF INCREMENTS |
|------------------|---------------------------|----------------------|---------------------------|------------------------|
| 6 | 100 | 24.7 | 24.7 | 6 |
| 12 | 120 | 29.6 | 4.9 | 6 |
| 24 | 130 | 32.1 | 2.5 | 12 |



PMP FOR 200 SQ MI +
24 HRS DURATION = 24.7"

DAM NO. 10212

LOCATION OF CENTROID
OF WATERSHED:

AT 39°06'30" LONG 90°48'41"

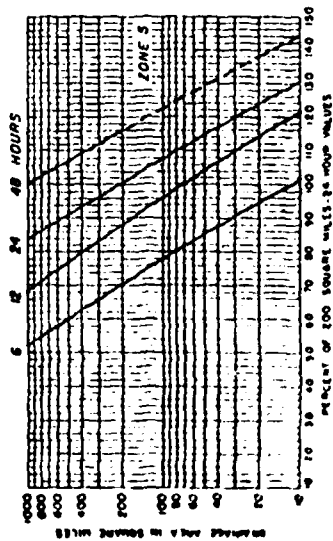
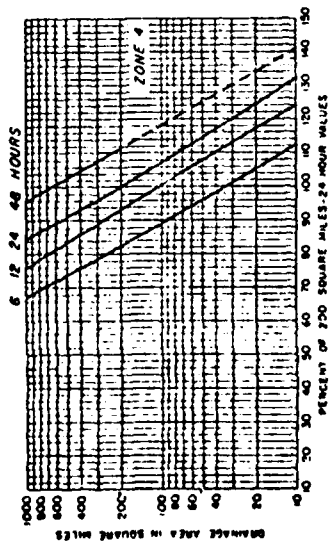
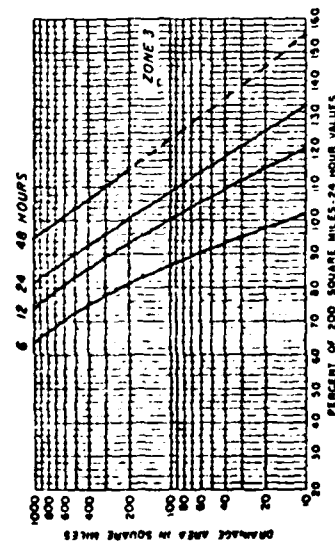
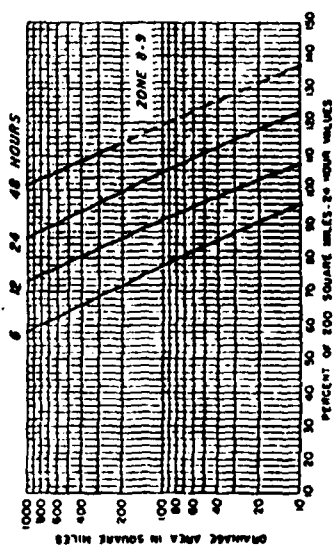
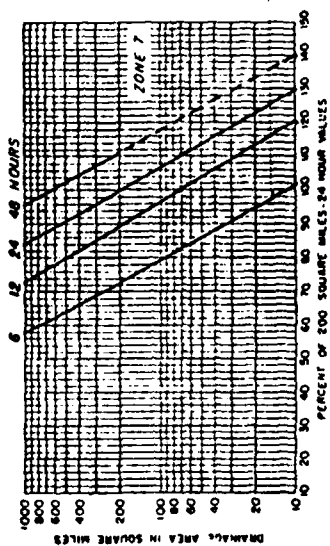
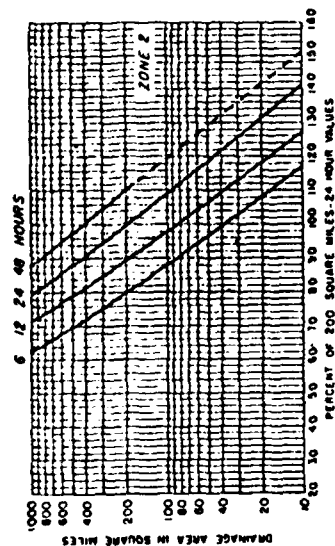
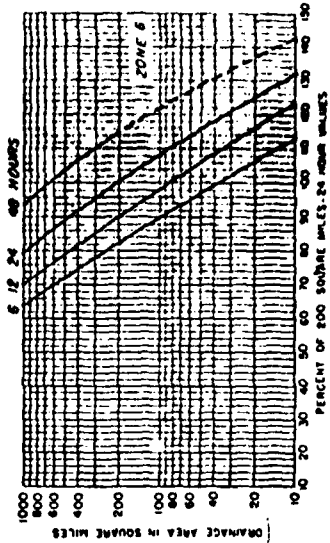
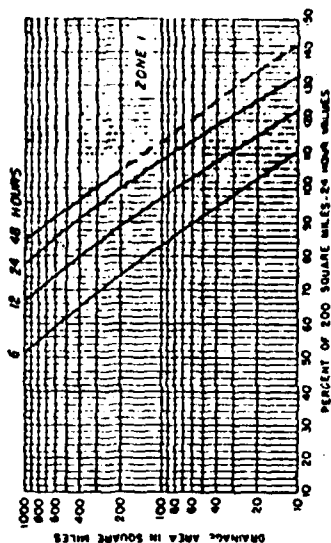


FIGURE 2
SEASONAL VARIATION
DEPTH-AREA-DURATION RELATIONSHIPS
Percentage to be applied to 200 square miles
24 hour probable maximum precipitation values
for: THE-ALL SEASON ENVELOPE

DAM SAFETY INSPECTION - MISSOURI

SHEET NO. 1 OF

LOST LAKE DAM # MO. 10212

JOB NO. 1240

UNIT HYDROGRAPH PARAMETERS

BY DNZ

DATE 6/11/79

KLG 6/22/79

1. DRAINAGE AREA, $A = 676 \text{ ACRES} = 1.06 \text{ SQ MI.}$
2. LENGTH OF STREAM, $L = 1.33 \text{ MI} = 7022 \text{ FE}$
3. ELEVATION AT DRAINAGE DIVIDE ALONG LONGEST STREAM.
 $H_1 = 945 \text{ FE}$
4. RESERVOIR ELEVATION AT SPILLWAY CREST, $H_2 = 617 \text{ FE}$
5. DIFFERENCE IN ELEVATION, $\Delta H = 328 \text{ FE}$
6. AVERAGE SLOPE OF STREAM = $\frac{\Delta H}{L} = \frac{328}{7022} = 4.67\%$
7. TIME OF CONCENTRATION:

a) BY KIRPICH FORMULA:

$$T_c = \left(\frac{11.9 \times L^3}{\Delta H} \right)^{0.385} = \left(\frac{11.9 \times 1.33^3}{331} \right)^{0.385} = 0.39 \text{ HR}$$

b) BY VELOCITY ESTIMATE: AVG VEL = 4.0 FPS

$$T_c = \frac{L}{V} = \frac{7022}{4(60 \times 60)} = 0.49 \text{ HR}$$

USE $T_c = 0.39$

$$8. \text{ LAG TIME, } L_t = 0.6 \times 0.39 = 0.23$$

$$9. \text{ UNIT DURATION, } D \leq \frac{L_t}{3} = \frac{0.23}{3} = 0.077 < 0.083$$

USE $D = 0.083$

$$10. \text{ TIME TO PEAK, } T_p = \frac{D}{2} + L_t = \frac{0.083}{2} + 0.23 = 0.272$$

$$11. \text{ PEAK DISCHARGE, } q_p = \frac{484 A}{T_p} = \frac{484 (1.06)}{0.272}$$

$$q_p = 1886 \text{ CFS}$$

DAM SAFETY INSPECTION / MISSOURI

SHEET NO. 1 OF

LOST LAKE DAM (MO. 10212)

JOB NO. 1240-001

HYDROLOGIC SOIL GROUP & CURVE NUMBER

BY MAS DATE 7/11/78

LOST LAKE DAM (MO. 10212)DETERMINATION OF HYDROLOGIC SOIL GROUP & SCS CURVE NUMBER

1. Watershed soils consist of group B and C soils. Soil group B seems to be predominant. Assume soil group B for the entire watershed.
2. Most of the watershed is wooded and covered with grass. Assume hydrologic condition of the watershed to be "Fair" for infiltration purpose.

thus $CN = 60$ for AMC-II & group B soil.

$\Rightarrow CN = 78$ for AMC-III & group B soil.

DAM SAFETY INSPECTION - MISSOURI

SHEET NO. 1 OF

LOST LAKE DAM - (#10312)

JOB NO. 1240-001

100 YR FLOOD FROM REGRESSION EQUATION

BY KLB
v MAS DATE 6-22-71LOST LAKE DAM100 YR FLOOD FROM REGRESSION EQUATION.REGRESSION EQUATION FOR 100-YR FLOOD
FOR MISSOURI:

$$Q_{100} = 85.1 A^{0.934} S^{0.576}$$

WHERE

A = DRAINAGE AREA IN SQ. MI.

S = MAIN CHANNEL SLOPE FE/MI
(AVG. SLOPE BETWEEN D.I.L. AND D.B.L.)

FOR LOST LAKE DAM:

A = 1.06 SQ. MI.

S = 142 FE/MI.

$$Q_{100} = 85.1 (1.06)^{0.934} (142)^{0.576}$$

$$Q_{100} = 1560 \text{ CFS.}$$

HEC1DB INPUT DATA

[illegible]

PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

RUNOFF HYDROGRAPH AT 10212
ROUTE HYDROGRAPH TO 10312
END OF NETWORK

INFLOW PMF AND ONE-HALF PMF HYDROGRAPHS

.....
 FLOOD HYDROGRAPH PACKAGE (HEC-1)
 DAN SAFETY VERSION JULY 1974
 LAST MODIFICATION 26 FEB 75

RUN DATE: 79/07/13,
 TIME: 11.47.33.

DAN SAFETY INSPECTION - HQ 5000J
 100% LAKE OAK (100%)
 ONE AND 50 PERCENT RPF DETERMINATION AND ROUTING

| JOG SPECIFICATION | | | | | | | | | |
|-------------------|------|------|-----|-----|------|------|------|------|------|
| NO | NAME | ICAY | IMR | IMR | ICAY | ICPT | ICPT | ICPT | ICPT |
| 500 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | JOGP | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | ICPT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

MULTI-STEP ANALYSIS TO BE PERFORMED
 UPLAND FLOODING SOLUTION 1
 MTIOSE 11.00 - 50

.....

AREA FLOOD COMPUTATION

INPUT PRECIPITATION INDEX, RATIO, AND UNIT HYDROGRAPH RESULTS

| ICAY | ICPT | ICAY | ICPT | ICAY | ICPT | ICAY | ICPT | ICAY | ICPT |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 10012 | 10012 | 10012 | 10012 | 10012 | 10012 | 10012 | 10012 | 10012 | 10012 |

| HYDROGRAPH DATA | | | | | | | | | |
|-----------------|------|------|------|------|------|------|------|------|------|
| INVOG | ICAY | ICPT | ICAY | ICPT | ICAY | ICPT | ICAY | ICPT | ICPT |
| 1 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

| PEAK DATA | | | | | | | | | |
|-----------|-------|--------|--------|--------|--------|--------|--------|--------|--------|
| SPFE | ICAY | ICPT | ICAY | ICPT | ICAY | ICPT | ICAY | ICPT | ICPT |
| 0.10 | 24.70 | 100.00 | 120.00 | 130.00 | 140.00 | 150.00 | 160.00 | 170.00 | 180.00 |

| LOSS DATA | | | | | | | | | |
|-----------|------|------|------|------|------|------|------|------|------|
| INVOG | ICAY | ICPT | ICAY | ICPT | ICAY | ICPT | ICAY | ICPT | ICPT |
| 1 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

CURVE NO. 1 100% LAKE OAK (100%)

UNIT HYDROGRAPH DATA

PRECIPITATION DATA

.....

| NO. DA | HR. MN | PERIOD | RAIN | EXCS | LOSS | COMP O | IND-OF-PERIOD FLOW | MD. DA | HR. MN | PERIOD | RAIN | EXCS | LOSS | COMP |
|--------|--------|--------|------|------|------|--------|--------------------|--------|--------|--------|------|------|-------|------|
| 1.01 | 0.5 | 1 | .01 | 0.00 | .01 | 0 | 1.01 | 12.15 | 151 | .21 | .19 | .02 | 1940. | |
| 1.01 | 1.0 | 2 | .01 | 0.00 | .01 | 0 | 1.01 | 12.40 | 152 | .21 | .19 | .02 | 1978. | |
| 1.01 | 1.5 | 3 | .01 | 0.00 | .01 | 0 | 1.01 | 12.45 | 153 | .21 | .19 | .02 | 1984. | |
| 1.01 | 2.0 | 4 | .01 | 0.00 | .01 | 0 | 1.01 | 12.50 | 154 | .21 | .19 | .02 | 1992. | |
| 1.01 | 2.5 | 5 | .01 | 0.00 | .01 | 0 | 1.01 | 12.55 | 155 | .21 | .19 | .02 | 1995. | |
| 1.01 | 3.0 | 6 | .01 | 0.00 | .01 | 0 | 1.01 | 13.00 | 156 | .21 | .19 | .02 | 1998. | |
| 1.01 | 3.5 | 7 | .01 | 0.00 | .01 | 0 | 1.01 | 13.05 | 157 | .25 | .23 | .02 | 1998. | |
| 1.01 | 4.0 | 8 | .01 | 0.00 | .01 | 0 | 1.01 | 13.10 | 158 | .25 | .23 | .02 | 1998. | |
| 1.01 | 4.5 | 9 | .01 | 0.00 | .01 | 0 | 1.01 | 13.15 | 159 | .25 | .23 | .02 | 1998. | |
| 1.01 | 5.0 | 10 | .01 | 0.00 | .01 | 0 | 1.01 | 13.20 | 160 | .25 | .23 | .01 | 1998. | |
| 1.01 | 5.5 | 11 | .01 | 0.00 | .01 | 0 | 1.01 | 13.25 | 161 | .25 | .23 | .01 | 1998. | |
| 1.01 | 6.0 | 12 | .01 | 0.00 | .01 | 0 | 1.01 | 13.30 | 162 | .25 | .23 | .01 | 1997. | |
| 1.01 | 6.5 | 13 | .01 | 0.00 | .01 | 0 | 1.01 | 13.35 | 163 | .25 | .23 | .01 | 1979. | |
| 1.01 | 7.0 | 14 | .01 | 0.00 | .01 | 0 | 1.01 | 13.40 | 164 | .25 | .23 | .01 | 1894. | |
| 1.01 | 7.5 | 15 | .01 | 0.00 | .01 | 0 | 1.01 | 13.45 | 165 | .25 | .23 | .01 | 1894. | |
| 1.01 | 8.0 | 16 | .01 | 0.00 | .01 | 0 | 1.01 | 13.50 | 166 | .25 | .24 | .01 | 1912. | |
| 1.01 | 8.5 | 17 | .01 | 0.00 | .01 | 0 | 1.01 | 13.55 | 167 | .25 | .24 | .01 | 1912. | |
| 1.01 | 9.0 | 18 | .01 | 0.00 | .01 | 0 | 1.01 | 14.00 | 168 | .25 | .24 | .01 | 1924. | |
| 1.01 | 9.5 | 19 | .01 | 0.00 | .01 | 0 | 1.01 | 14.05 | 169 | .25 | .24 | .01 | 1951. | |
| 1.01 | 1.00 | 20 | .01 | 0.00 | .01 | 0 | 1.01 | 14.10 | 170 | .25 | .24 | .01 | 2031. | |
| 1.01 | 1.05 | 21 | .01 | 0.00 | .01 | 0 | 1.01 | 14.15 | 171 | .25 | .24 | .01 | 2146. | |
| 1.01 | 1.10 | 22 | .01 | 0.00 | .01 | 0 | 1.01 | 14.20 | 172 | .25 | .24 | .01 | 2251. | |
| 1.01 | 1.15 | 23 | .01 | 0.00 | .01 | 0 | 1.01 | 14.25 | 173 | .25 | .24 | .01 | 2327. | |
| 1.01 | 1.20 | 24 | .01 | 0.00 | .01 | 0 | 1.01 | 14.30 | 174 | .25 | .24 | .01 | 2371. | |
| 1.01 | 2.05 | 26 | .01 | 0.00 | .01 | 0 | 1.01 | 14.35 | 175 | .25 | .24 | .01 | 2401. | |
| 1.01 | 2.10 | 27 | .01 | 0.00 | .01 | 0 | 1.01 | 14.40 | 176 | .25 | .24 | .01 | 2420. | |
| 1.01 | 2.15 | 28 | .01 | 0.00 | .01 | 0 | 1.01 | 14.45 | 177 | .25 | .24 | .01 | 2432. | |
| 1.01 | 2.20 | 29 | .01 | 0.00 | .01 | 0 | 1.01 | 14.50 | 178 | .25 | .24 | .01 | 2441. | |
| 1.01 | 2.25 | 30 | .01 | 0.00 | .01 | 0 | 1.01 | 14.55 | 179 | .25 | .24 | .01 | 2448. | |
| 1.01 | 2.30 | 31 | .01 | 0.00 | .01 | 0 | 1.01 | 15.00 | 180 | .25 | .24 | .01 | 2453. | |
| 1.01 | 2.35 | 32 | .01 | 0.00 | .01 | 0 | 1.01 | 15.05 | 181 | .25 | .24 | .01 | 2413. | |
| 1.01 | 2.40 | 33 | .01 | 0.00 | .01 | 0 | 1.01 | 15.10 | 182 | .25 | .24 | .01 | 2334. | |
| 1.01 | 2.45 | 34 | .01 | 0.00 | .01 | 0 | 1.01 | 15.15 | 183 | .25 | .24 | .01 | 2344. | |
| 1.01 | 2.50 | 35 | .01 | 0.00 | .01 | 0 | 1.01 | 15.20 | 184 | .25 | .24 | .01 | 2351. | |
| 1.01 | 2.55 | 36 | .01 | 0.00 | .01 | 0 | 1.01 | 15.25 | 185 | .25 | .24 | .01 | 2362. | |
| 1.01 | 3.00 | 37 | .01 | 0.00 | .01 | 0 | 1.01 | 15.30 | 186 | .25 | .24 | .01 | 2366. | |
| 1.01 | 3.05 | 38 | .01 | 0.00 | .01 | 0 | 1.01 | 15.35 | 187 | .25 | .24 | .01 | 2368. | |
| 1.01 | 3.10 | 39 | .01 | 0.00 | .01 | 0 | 1.01 | 15.40 | 188 | .25 | .24 | .01 | 2368. | |
| 1.01 | 3.15 | 40 | .01 | 0.00 | .01 | 0 | 1.01 | 15.45 | 189 | .25 | .24 | .01 | 2368. | |
| 1.01 | 3.20 | 41 | .01 | 0.00 | .01 | 0 | 1.01 | 15.50 | 190 | .25 | .24 | .01 | 2368. | |
| 1.01 | 3.25 | 42 | .01 | 0.00 | .01 | 0 | 1.01 | 15.55 | 191 | .25 | .24 | .01 | 2368. | |
| 1.01 | 3.30 | 43 | .01 | 0.00 | .01 | 0 | 1.01 | 16.00 | 192 | .25 | .24 | .01 | 2368. | |
| 1.01 | 3.35 | 44 | .01 | 0.00 | .01 | 0 | 1.01 | 16.05 | 193 | .25 | .24 | .01 | 2368. | |
| 1.01 | 3.40 | 45 | .01 | 0.00 | .01 | 0 | 1.01 | 16.10 | 194 | .25 | .24 | .01 | 2368. | |
| 1.01 | 3.45 | 46 | .01 | 0.00 | .01 | 0 | 1.01 | 16.15 | 195 | .25 | .24 | .01 | 2368. | |
| 1.01 | 3.50 | 47 | .01 | 0.00 | .01 | 0 | 1.01 | 16.20 | 196 | .25 | .24 | .01 | 2368. | |
| 1.01 | 3.55 | 48 | .01 | 0.00 | .01 | 0 | 1.01 | 16.25 | 197 | .25 | .24 | .01 | 2368. | |
| 1.01 | 4.00 | 49 | .01 | 0.00 | .01 | 0 | 1.01 | 16.30 | 198 | .25 | .24 | .01 | 2368. | |
| 1.01 | 4.05 | 50 | .01 | 0.00 | .01 | 0 | 1.01 | 16.35 | 199 | .25 | .24 | .01 | 2368. | |
| 1.01 | 4.10 | 51 | .01 | 0.00 | .01 | 0 | 1.01 | 16.40 | 200 | .25 | .24 | .01 | 2368. | |
| 1.01 | 4.15 | 52 | .01 | 0.00 | .01 | 0 | 1.01 | 16.45 | 201 | .25 | .24 | .01 | 2368. | |
| 1.01 | 4.20 | 53 | .01 | 0.00 | .01 | 0 | 1.01 | 16.50 | 202 | .25 | .24 | .01 | 2368. | |
| 1.01 | 4.25 | 54 | .01 | 0.00 | .01 | 0 | 1.01 | 16.55 | 203 | .25 | .24 | .01 | 2368. | |
| 1.01 | 4.30 | 55 | .01 | 0.00 | .01 | 0 | 1.01 | 17.00 | 204 | .25 | .24 | .01 | 2368. | |
| 1.01 | 4.35 | 56 | .01 | 0.00 | .01 | 0 | 1.01 | 17.05 | 205 | .25 | .24 | .01 | 2368. | |
| 1.01 | 4.40 | 57 | .01 | 0.00 | .01 | 0 | 1.01 | 17.10 | 206 | .25 | .24 | .01 | 2368. | |

| | | | | | | | | | | | | | |
|------|------|-----|-----|-----|-----|-----|------|-------|-----|-----|-----|-----|-------|
| 1.01 | 4.45 | 57 | .01 | .00 | .01 | 12. | 1.01 | 17.15 | 207 | .23 | .22 | .00 | 2120. |
| 1.01 | 4.50 | 58 | .01 | .00 | .01 | 13. | 1.01 | 17.20 | 208 | .23 | .22 | .00 | 2023. |
| 1.01 | 4.55 | 59 | .01 | .00 | .01 | 14. | 1.01 | 17.25 | 209 | .23 | .22 | .00 | 1949. |
| 1.01 | 4.60 | 60 | .01 | .00 | .01 | 15. | 1.01 | 17.30 | 210 | .23 | .22 | .00 | 1907. |
| 1.01 | 4.65 | 61 | .01 | .00 | .01 | 16. | 1.01 | 17.35 | 211 | .23 | .22 | .00 | 1881. |
| 1.01 | 4.70 | 62 | .01 | .00 | .01 | 17. | 1.01 | 17.40 | 212 | .23 | .22 | .00 | 1866. |
| 1.01 | 4.75 | 63 | .01 | .00 | .01 | 18. | 1.01 | 17.45 | 213 | .23 | .22 | .00 | 1857. |
| 1.01 | 4.80 | 64 | .01 | .00 | .01 | 19. | 1.01 | 17.50 | 214 | .23 | .22 | .00 | 1851. |
| 1.01 | 4.85 | 65 | .01 | .00 | .01 | 20. | 1.01 | 17.55 | 215 | .23 | .22 | .00 | 1848. |
| 1.01 | 4.90 | 66 | .01 | .00 | .01 | 21. | 1.01 | 18.00 | 216 | .23 | .22 | .00 | 1846. |
| 1.01 | 4.95 | 67 | .01 | .00 | .01 | 22. | 1.01 | 18.05 | 217 | .23 | .22 | .00 | 1846. |
| 1.01 | 5.00 | 68 | .01 | .00 | .01 | 23. | 1.01 | 18.10 | 218 | .23 | .22 | .00 | 1846. |
| 1.01 | 5.05 | 69 | .01 | .00 | .01 | 24. | 1.01 | 18.15 | 219 | .23 | .22 | .00 | 1846. |
| 1.01 | 5.10 | 70 | .01 | .00 | .01 | 25. | 1.01 | 18.20 | 220 | .23 | .22 | .00 | 1846. |
| 1.01 | 5.15 | 71 | .01 | .00 | .01 | 26. | 1.01 | 18.25 | 221 | .23 | .22 | .00 | 1846. |
| 1.01 | 5.20 | 72 | .01 | .00 | .01 | 27. | 1.01 | 18.30 | 222 | .23 | .22 | .00 | 1846. |
| 1.01 | 5.25 | 73 | .01 | .00 | .01 | 28. | 1.01 | 18.35 | 223 | .23 | .22 | .00 | 1846. |
| 1.01 | 5.30 | 74 | .01 | .00 | .01 | 29. | 1.01 | 18.40 | 224 | .23 | .22 | .00 | 1846. |
| 1.01 | 5.35 | 75 | .01 | .00 | .01 | 30. | 1.01 | 18.45 | 225 | .23 | .22 | .00 | 1846. |
| 1.01 | 5.40 | 76 | .01 | .00 | .01 | 31. | 1.01 | 18.50 | 226 | .23 | .22 | .00 | 1846. |
| 1.01 | 5.45 | 77 | .01 | .00 | .01 | 32. | 1.01 | 18.55 | 227 | .23 | .22 | .00 | 1846. |
| 1.01 | 5.50 | 78 | .01 | .00 | .01 | 33. | 1.01 | 19.00 | 228 | .23 | .22 | .00 | 1846. |
| 1.01 | 5.55 | 79 | .01 | .00 | .01 | 34. | 1.01 | 19.05 | 229 | .23 | .22 | .00 | 1846. |
| 1.01 | 5.60 | 80 | .01 | .00 | .01 | 35. | 1.01 | 19.10 | 230 | .23 | .22 | .00 | 1846. |
| 1.01 | 5.65 | 81 | .01 | .00 | .01 | 36. | 1.01 | 19.15 | 231 | .23 | .22 | .00 | 1846. |
| 1.01 | 5.70 | 82 | .01 | .00 | .01 | 37. | 1.01 | 19.20 | 232 | .23 | .22 | .00 | 1846. |
| 1.01 | 5.75 | 83 | .01 | .00 | .01 | 38. | 1.01 | 19.25 | 233 | .23 | .22 | .00 | 1846. |
| 1.01 | 5.80 | 84 | .01 | .00 | .01 | 39. | 1.01 | 19.30 | 234 | .23 | .22 | .00 | 1846. |
| 1.01 | 5.85 | 85 | .01 | .00 | .01 | 40. | 1.01 | 19.35 | 235 | .23 | .22 | .00 | 1846. |
| 1.01 | 5.90 | 86 | .01 | .00 | .01 | 41. | 1.01 | 19.40 | 236 | .23 | .22 | .00 | 1846. |
| 1.01 | 5.95 | 87 | .01 | .00 | .01 | 42. | 1.01 | 19.45 | 237 | .23 | .22 | .00 | 1846. |
| 1.01 | 6.00 | 88 | .01 | .00 | .01 | 43. | 1.01 | 19.50 | 238 | .23 | .22 | .00 | 1846. |
| 1.01 | 6.05 | 89 | .01 | .00 | .01 | 44. | 1.01 | 19.55 | 239 | .23 | .22 | .00 | 1846. |
| 1.01 | 6.10 | 90 | .01 | .00 | .01 | 45. | 1.01 | 20.00 | 240 | .23 | .22 | .00 | 1846. |
| 1.01 | 6.15 | 91 | .01 | .00 | .01 | 46. | 1.01 | 20.05 | 241 | .23 | .22 | .00 | 1846. |
| 1.01 | 6.20 | 92 | .01 | .00 | .01 | 47. | 1.01 | 20.10 | 242 | .23 | .22 | .00 | 1846. |
| 1.01 | 6.25 | 93 | .01 | .00 | .01 | 48. | 1.01 | 20.15 | 243 | .23 | .22 | .00 | 1846. |
| 1.01 | 6.30 | 94 | .01 | .00 | .01 | 49. | 1.01 | 20.20 | 244 | .23 | .22 | .00 | 1846. |
| 1.01 | 6.35 | 95 | .01 | .00 | .01 | 50. | 1.01 | 20.25 | 245 | .23 | .22 | .00 | 1846. |
| 1.01 | 6.40 | 96 | .01 | .00 | .01 | 51. | 1.01 | 20.30 | 246 | .23 | .22 | .00 | 1846. |
| 1.01 | 6.45 | 97 | .01 | .00 | .01 | 52. | 1.01 | 20.35 | 247 | .23 | .22 | .00 | 1846. |
| 1.01 | 6.50 | 98 | .01 | .00 | .01 | 53. | 1.01 | 20.40 | 248 | .23 | .22 | .00 | 1846. |
| 1.01 | 6.55 | 99 | .01 | .00 | .01 | 54. | 1.01 | 20.45 | 249 | .23 | .22 | .00 | 1846. |
| 1.01 | 6.60 | 100 | .01 | .00 | .01 | 55. | 1.01 | 20.50 | 250 | .23 | .22 | .00 | 1846. |
| 1.01 | 6.65 | 101 | .01 | .00 | .01 | 56. | 1.01 | 20.55 | 251 | .23 | .22 | .00 | 1846. |
| 1.01 | 6.70 | 102 | .01 | .00 | .01 | 57. | 1.01 | 21.00 | 252 | .23 | .22 | .00 | 1846. |
| 1.01 | 6.75 | 103 | .01 | .00 | .01 | 58. | 1.01 | 21.05 | 253 | .23 | .22 | .00 | 1846. |
| 1.01 | 6.80 | 104 | .01 | .00 | .01 | 59. | 1.01 | 21.10 | 254 | .23 | .22 | .00 | 1846. |
| 1.01 | 6.85 | 105 | .01 | .00 | .01 | 60. | 1.01 | 21.15 | 255 | .23 | .22 | .00 | 1846. |
| 1.01 | 6.90 | 106 | .01 | .00 | .01 | 61. | 1.01 | 21.20 | 256 | .23 | .22 | .00 | 1846. |
| 1.01 | 6.95 | 107 | .01 | .00 | .01 | 62. | 1.01 | 21.25 | 257 | .23 | .22 | .00 | 1846. |
| 1.01 | 7.00 | 108 | .01 | .00 | .01 | 63. | 1.01 | 21.30 | 258 | .23 | .22 | .00 | 1846. |
| 1.01 | 7.05 | 109 | .01 | .00 | .01 | 64. | 1.01 | 21.35 | 259 | .23 | .22 | .00 | 1846. |
| 1.01 | 7.10 | 110 | .01 | .00 | .01 | 65. | 1.01 | 21.40 | 260 | .23 | .22 | .00 | 1846. |
| 1.01 | 7.15 | 111 | .01 | .00 | .01 | 66. | 1.01 | 21.45 | 261 | .23 | .22 | .00 | 1846. |
| 1.01 | 7.20 | 112 | .01 | .00 | .01 | 67. | 1.01 | 21.50 | 262 | .23 | .22 | .00 | 1846. |
| 1.01 | 7.25 | 113 | .01 | .00 | .01 | 68. | 1.01 | 21.55 | 263 | .23 | .22 | .00 | 1846. |
| 1.01 | 7.30 | 114 | .01 | .00 | .01 | 69. | 1.01 | 22.00 | 264 | .23 | .22 | .00 | 1846. |
| 1.01 | 7.35 | 115 | .01 | .00 | .01 | 70. | 1.01 | 22.05 | 265 | .23 | .22 | .00 | 1846. |
| 1.01 | 7.40 | 116 | .01 | .00 | .01 | 71. | 1.01 | 22.10 | 266 | .23 | .22 | .00 | 1846. |

| | | | | | | | | |
|------|------|------|------|------|------|------|------|-------|
| 427. | 430. | 433. | 436. | 439. | 441. | 444. | 447. | 449. |
| 428. | 431. | 434. | 437. | 440. | 443. | 446. | 449. | 471. |
| 429. | 432. | 435. | 438. | 441. | 444. | 447. | 450. | 472. |
| 430. | 433. | 436. | 439. | 442. | 445. | 448. | 451. | 486. |
| 431. | 434. | 437. | 440. | 443. | 446. | 449. | 452. | 1381. |
| 432. | 435. | 438. | 441. | 444. | 447. | 450. | 453. | 1773. |
| 433. | 436. | 439. | 442. | 445. | 448. | 451. | 454. | 2031. |
| 434. | 437. | 440. | 443. | 446. | 449. | 452. | 455. | 2031. |
| 435. | 438. | 441. | 444. | 447. | 450. | 453. | 456. | 2031. |
| 436. | 439. | 442. | 445. | 448. | 451. | 454. | 457. | 2031. |
| 437. | 440. | 443. | 446. | 449. | 452. | 455. | 458. | 2031. |
| 438. | 441. | 444. | 447. | 450. | 453. | 456. | 459. | 2031. |
| 439. | 442. | 445. | 448. | 451. | 454. | 457. | 460. | 2031. |
| 440. | 443. | 446. | 449. | 452. | 455. | 458. | 461. | 2031. |
| 441. | 444. | 447. | 450. | 453. | 456. | 459. | 462. | 2031. |
| 442. | 445. | 448. | 451. | 454. | 457. | 460. | 463. | 2031. |
| 443. | 446. | 449. | 452. | 455. | 458. | 461. | 464. | 2031. |
| 444. | 447. | 450. | 453. | 456. | 459. | 462. | 465. | 2031. |
| 445. | 448. | 451. | 454. | 457. | 460. | 463. | 466. | 2031. |
| 446. | 449. | 452. | 455. | 458. | 461. | 464. | 467. | 2031. |
| 447. | 450. | 453. | 456. | 459. | 462. | 465. | 468. | 2031. |
| 448. | 451. | 454. | 457. | 460. | 463. | 466. | 469. | 2031. |
| 449. | 452. | 455. | 458. | 461. | 464. | 467. | 470. | 2031. |
| 450. | 453. | 456. | 459. | 462. | 465. | 468. | 471. | 2031. |
| 451. | 454. | 457. | 460. | 463. | 466. | 469. | 472. | 2031. |
| 452. | 455. | 458. | 461. | 464. | 467. | 470. | 473. | 2031. |
| 453. | 456. | 459. | 462. | 465. | 468. | 471. | 474. | 2031. |
| 454. | 457. | 460. | 463. | 466. | 469. | 472. | 475. | 2031. |
| 455. | 458. | 461. | 464. | 467. | 470. | 473. | 476. | 2031. |
| 456. | 459. | 462. | 465. | 468. | 471. | 474. | 477. | 2031. |
| 457. | 460. | 463. | 466. | 469. | 472. | 475. | 478. | 2031. |
| 458. | 461. | 464. | 467. | 470. | 473. | 476. | 479. | 2031. |
| 459. | 462. | 465. | 468. | 471. | 474. | 477. | 480. | 2031. |
| 460. | 463. | 466. | 469. | 472. | 475. | 478. | 481. | 2031. |
| 461. | 464. | 467. | 470. | 473. | 476. | 479. | 482. | 2031. |
| 462. | 465. | 468. | 471. | 474. | 477. | 480. | 483. | 2031. |
| 463. | 466. | 469. | 472. | 475. | 478. | 481. | 484. | 2031. |
| 464. | 467. | 470. | 473. | 476. | 479. | 482. | 485. | 2031. |
| 465. | 468. | 471. | 474. | 477. | 480. | 483. | 486. | 2031. |
| 466. | 469. | 472. | 475. | 478. | 481. | 484. | 487. | 2031. |
| 467. | 470. | 473. | 476. | 479. | 482. | 485. | 488. | 2031. |
| 468. | 471. | 474. | 477. | 480. | 483. | 486. | 489. | 2031. |
| 469. | 472. | 475. | 478. | 481. | 484. | 487. | 490. | 2031. |
| 470. | 473. | 476. | 479. | 482. | 485. | 488. | 491. | 2031. |
| 471. | 474. | 477. | 480. | 483. | 486. | 489. | 492. | 2031. |
| 472. | 475. | 478. | 481. | 484. | 487. | 490. | 493. | 2031. |
| 473. | 476. | 479. | 482. | 485. | 488. | 491. | 494. | 2031. |
| 474. | 477. | 480. | 483. | 486. | 489. | 492. | 495. | 2031. |
| 475. | 478. | 481. | 484. | 487. | 490. | 493. | 496. | 2031. |
| 476. | 479. | 482. | 485. | 488. | 491. | 494. | 497. | 2031. |
| 477. | 480. | 483. | 486. | 489. | 492. | 495. | 498. | 2031. |
| 478. | 481. | 484. | 487. | 490. | 493. | 496. | 499. | 2031. |
| 479. | 482. | 485. | 488. | 49 | | | | |

HYDROGRAPH AT SYDNEY FOR FLAP 1, FIG 2

30. 11. 7. 2. 1.
 PEAK 6-HOUR 24-HOUR 72-HOUR TOTAL VOLUME
 1284. 1560. 412. 396. 116786.
 CUS 150. 36. 12. 11. 3344.
 INCHES 11.48 14.48 14.48 14.48
 391.30 367.75 367.75 367.75
 AC-FT 170. 818. 818. 1009.
 THOLS CU M 326. 1309. 1009.

HYDROGRAPH ROUTING

ROUTE HYDROGRAPH THROUGH LOST LAKE DAM (10212)

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|
| STAGE | 617.00 | 617.50 | 618.00 | 618.50 | 619.00 | 619.50 | 620.00 | 620.50 | 621.00 | 621.50 | 622.00 | 622.50 | 623.00 | 623.50 | 624.00 | 624.50 | 625.00 | 625.50 | 626.00 | 626.50 | 627.00 | 627.50 | 628.00 | 628.50 | 629.00 | 629.50 | 630.00 | 630.50 | 631.00 | 631.50 | 632.00 | 632.50 | 633.00 | 633.50 | 634.00 | 634.50 | 635.00 | |
| FLOW | 0.00 | 13.00 | 37.00 | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | |
| CAPACITY | 0. | 33. | 72. | 123. | 123. | 123. | 123. | 123. | 123. | 123. | 123. | 123. | 123. | 123. | 123. | 123. | 123. | 123. | 123. | 123. | 123. | 123. | 123. | 123. | 123. | 123. | 123. | 123. | 123. | 123. | 123. | 123. | 123. | 123. | 123. | 123. | 123. | 123. |
| ELEVATION | 605. | 614. | 617. | 617. | 617. | 617. | 617. | 617. | 617. | 617. | 617. | 617. | 617. | 617. | 617. | 617. | 617. | 617. | 617. | 617. | 617. | 617. | 617. | 617. | 617. | 617. | 617. | 617. | 617. | 617. | 617. | 617. | 617. | 617. | 617. | 617. | 617. | 617. |

SUMMARY OF PMF AND ONE-HALF PMF FLOOD ROUTING

PEAK FLOW AND STORAGE (AND IF PERIOD) SUMMARY FOR MULTIPLE REGISTRATION ECONOMIC COMPUTATIONS
 FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
 AREA IN SQUARE MILES (SQUARE KILOMETERS)

RATIOS APPLIED TO FLOWS

PLAN RATIO 1 4411.0
 1.50

AREA PLAN RATIO 1 4411.0
 1.50

HYDROGRAPH AT 10212 1.25 1.1568 527.4
 (2.75) (295.27) 149.631

ROUTES TO 10217 1.00 1.7020 1903.
 (2.75) (215.73) 55.631

SUMMARY OF DAM SAFETY ANALYSIS

| PLAN 1 | ELEVATION
STORAGE
OUTFLOW | INITIAL VALUE
417.00
72.
72. | STILLWAY CREST
517.00
72.
72. | TOP OF DAM
537.00
669.
500% | | |
|--------------------|----------------------------------|---------------------------------------|--|--------------------------------------|---------------------------------|-----------------------------|
| RATIO
OF
PMF | MAXIMUM
RESERVOIR
W.S. LEV | MAXIMUM
STORAGE
AC-FT | MAXIMUM
OUTFLOW
CFS | DURATION
OVER TOP
HOURS | TIME OF
MAX OUTFLOW
HOURS | TIME OF
FAILURE
HOURS |
| 1.00
.50 | 637.00
634.12 | 702.
702. | 7620.
1993. | .42
0.00 | 15.00
16.25 | 0.00
0.00 |

PERCENT OF PMF FLOOD ROUTING
EQUAL TO SPILLWAY CAPACITY

PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

PUNOFF HYDROGRAPH AT 10212

ROUTE HYDROGRAPH TO 10212

END OF NETWORK

```

RUN DATE= 79/07/15
TIME= 15.07.15

```

1. JAW SAFETY INSPECTOR - MISSOURI
LOST LAK - DAN (10212)
PERCENT OF DMF DETEMINATION AND POUTING

| AGE | SEX | HRTD | IDAY | INR | INTN | METRIC | IPLT | IPRT | NSTAN |
|-----|-----|------|-------|-----|------|--------|-------|------|-------|
| 3-0 | 0 | -- | 3 | C | D | D | D | 4 | 0 |
| | | | JOPEN | | WAT | LBOY | YEACE | | |
| | | | | | 0 | 0 | 0 | | |

MULTI-PLAN ANALYSIS TO BE PERFORMED
 **PLAN= 1 **PICTURE= 9 **LAYOUT= 1

| BYLOS= | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 |
|--------|----|----|----|----|----|----|----|----|----|
| BYLOS= | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 |

100

SUN-2000A RULOFF COMPUTATION

INPUT PRECIPITATION INDEX, SAVIDS, AND JUIT HYDROGRAPH PARAMETERS

| ICST40 | ICOMP | IFCON | ITRE5 | JULY | JUPT | LYAME | LYVAGE | IAUTG |
|--------|-------|-------|-------|------|------|-------|--------|-------|
| 00012 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 |

| | | | | | | | | | | |
|--|--------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| | HYDROG | IUNG | TAPCA | S'IAF | TPSDA | TRSPC | RATIO | ISPOW | ISAUF | LOCAL |
| | | | - | C | | | | | | |

| | | | | | | |
|------|--------|--------|--------|-------------|-----|------|
| SPFF | PRECIP | R6 | <12 | PRECIP DATA | | |
| 0.00 | 0A-7C | 10G-9C | 12D-2B | 13E-3D | R48 | R96 |
| 0.00 | | | | | R72 | C-00 |

| LOOPT | STARR | DLTKR | RTIOL | ERRATN | STARRS | LOSS DATA | RTYOK | STRTL | CNSTL | ALSMX | RTIME |
|-------|-------|-------|-------|--------|--------|-----------|-------|-------|--------|-------|-------|
| 1 | 20.00 | 0.00 | 1.00 | 1.00 | 0.00 | | 1.20 | -1.20 | -70.00 | 0.00 | 0.00 |
| 2 | 20.00 | 0.00 | 1.00 | 1.00 | 0.00 | | 1.20 | -1.20 | -70.00 | 0.00 | 0.00 |

CURVE NO = -78.70 WFTNESS = -1.00 EFFECT CO = 78.00

UNIT HYDROGRAPH CETA
TC= 0.00 LAG= .23

RECESSION DATA
RTIOP= 1.00
RTIOP= 0.00
RTIOP= 0.00

| END-OF-PERIOD FLOW | | END-OF-PERIOD FLOW | |
|--------------------|--------|--------------------|--------|
| WD-DA | HR-MN | WD-DA | HR-MN |
| 0 | 0 | 0 | 0 |
| EXCS | LOSS | EXCS | LOSS |
| RAIN | RAIN | RAIN | RAIN |
| PERIOD | PERIOD | PERIOD | PERIOD |
| COMP Q | COMP Q | COMP Q | COMP Q |
| EXCS | LOSS | EXCS | LOSS |
| RAIN | RAIN | RAIN | RAIN |
| PERIOD | PERIOD | PERIOD | PERIOD |
| COMP Q | COMP Q | COMP Q | COMP Q |

PEAK OUTFLOW IS 5932, AT TIME 16.00 HOURS

[illegible]

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------|---------|------|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----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| HYDROGRAPH AT | 1-21-12 | 1:00 | 100 | 100 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
|---------------|---------|------|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--|

SUMMARY OF DAM SAFETY ANALYSIS

| PLAN 1 | ELEVATION
STORAGE
OUTFLOW | INITIAL VALUE
/17°C
12
0 | SPILLWAY CREST
17.00
1%
0 | TOP OF DAM
637.00
660
5475 | DURATION
OVER TOP
HOURS | MAXIMUM
OUTFLOW
CFS | TIME OF
MAX OUTFLOW
HOURS | TIME OF
FAILURE
HOURS |
|--------------|---------------------------------|-----------------------------------|------------------------------------|-------------------------------------|-------------------------------|---------------------------|---------------------------------|-----------------------------|
| RATIO
OF | MAXIMUM
RESERVOIR
ELEV | MAXIMUM
DEPTH
OVER DAM | MAXIMUM
STORAGE
AC-FT | | | | | |
| .75 | 615.05 | 0.00 | 652. | | 0.00 | 4705. | 15.00 | 0.00 |
| .76 | 616.07 | 0.00 | 655. | | 0.00 | 4815. | 15.00 | 0.00 |
| .77 | 616.73 | 0.10 | 658. | | 0.00 | 4920. | 15.00 | 0.00 |
| .78 | 617.40 | 0.20 | 661. | | 0.00 | 5024. | 15.00 | 0.00 |
| .79 | 618.07 | 0.30 | 664. | | 0.00 | 5174. | 15.00 | 0.00 |
| .80 | 618.73 | 0.40 | 668. | | 0.00 | 5323. | 15.00 | 0.00 |
| .81 | 619.40 | 0.50 | 671. | | 0.00 | 5471. | 15.00 | 0.00 |
| .82 | 620.07 | 0.60 | 675. | | 0.00 | 5618. | 15.00 | 0.00 |
| .83 | 620.73 | 0.70 | 679. | | 0.00 | 5762. | 15.00 | 0.00 |

